PARLIAMENT
OF KENYA
LIBRARY

22.11.22

REPUBLIC OF KENYA

# MINISTRY OF WATER, SANITATION AND IRRIGATION

# ANNUAL STATUS REPORT

# ON

# WATER, SANITATION AND IRRIGATION

Water is Life

Sanitation is Dignity

Irrigation for Food Security

**JUNE 2022**

# ANNUAL STATUS REPORT




REPUBLIC OF KENYA

## PREPARED AND COORDINATED
## BY
## MINISTRY OF WATER, SANITATION AND IRRIGATION



*Karimenu Dam*

**Copyright © Ministry of Water, Sanitation and Irrigation, 2022**
Maji House, Upper hill, Off Ngong road, Nairobi
P.O BOX 49720 – 00100, Nairobi
Telephone: +254 020 2716103, 4900000
Fax: +254 020 2727622
Email: ps@water.go.ke
Website: http://www.water.go.ke

Any reproduction, modification, publication, transmission, transfer, distribution, display or exploitation of this information, in any form or by any means, or its storage in a retrieval system, whether in whole or in part, is acceptable with the acknowledgment of the Ministry of Water, Sanitation and Irrigation.

# FOREWORD



The Constitution of Kenya articles 43d, 43b and 43c entitles every person to the right to water, reasonable standards of sanitation as well as food security. It further provides for two levels of government that are required to work in consultation and cooperation.

The mandate of the Ministry is development and management of Water Resources, Sanitation, Irrigation, Drainage and Land Reclamation. In discharging its mandate, the Ministry is guided by key policy documents which include the Constitution of Kenya, the Jubilee Manifesto, the Third Medium Term Plan 2018-2022 (MTP III) of the Kenya Vision 2030, Big Four Agenda, Ministry Strategic Plan 2018-2022 and, Legal and regulatory framework: the Water Act 2016, the Irrigation Act 2019 and National Water Policy of 2021. To harmonize water, sanitation and irrigation activities, the Ministry finalized the National Water Policy of 2021. The Water and Irrigation (General) Regulations 2021 have also been developed and have been published. The Ministry also finalized publication of the Irrigation Guidelines and the draft Procedure and Instrument for Handing Over Water, Sanitation, Irrigation and Land Reclamation projects was finalized. In addition, water, sanitation and irrigation strategies were also finalized and frameworks for establishment of County Irrigation Development Units (CIDUs) and one for establishment of an Irrigation Research Institution developed.

The Ministry has a target of increasing access to safe and clean water to 80% by the end of FY 2022/23 from 60% in 2017; and 40% access to reasonable standards of sanitation services from 25% in 2017. In addition, under MTP III, the Ministry also targets to increase area under irrigation by 190,000 acres from 510,000 acres in 2019 to 700,000 acres by end of FY 2022/23. To realize these targets, the ministry has prioritized a number of policies, legal and institutional reforms as well as programmes and projects which are at different stages of implementation.

Presently access to water is at 70% while urban sewerage is at 31% and area under irrigation stands at 664,000 acres. These falls short of the envisioned targets in view of the time remaining to 2022. However, the Ministry is currently implementing 685 projects aimed at achieving the desired targets.

Irrigation is a major contributor to the achievement of food security for Kenya as well as improving peoples' livelihoods and economic welfare. The irrigation potential is estimated at 1.913 million acres (765,575 ha) as per the National Water Master Plan 2030 without water

storage and can go up to 3 million acres (1.2 million ha). Out of this total potential 664,000 acres has been developed accounting for 35% coverage while out of the country's total arable land only 5.9% is equipped with irrigation infrastructure. This calls for concerted efforts towards increasing irrigation water use in a bid to increase yield to support food and nutrition security efforts and support growth in manufacturing vide agro-processing of surplus produce and value addition.

This third Annual Status report is a crucial document which tracks the state of the sector's development and key achievements towards realization of universal access to water and sanitation services, increase food security and its sustainable management through implementation of the developed policies and strategies. Equally, it provides opportunity to understand the challenges and emerging issues in the water, sanitation and irrigation sector. The report keeps the sector and stakeholders informed on progress and the bottlenecks to the sector's development. The Ministry and the sector institutions therefore, have to ensure that the challenges impeding sector development are adequately addressed towards realization of right to clean and safe water, reasonable standards of sanitation and adequate food for acceptable quality for progressive national development agenda. The Ministry will continue to successfully implement policy, legal and institutional reforms to address these challenges and accelerate unhindered achievement of its desired mandates.

In recognition of the need to make tangible impact in the water sector this year and in line with the Jubilee Government priorities, the Ministry implemented the Rapid Results Initiative (RRI). The 4th wave of RRI was undertaken between August and November 2021 while the 5th Wave was conducted between February and May 2022. The RRIs resulted in fast tracking the completion of key water and irrigation projects resulting in more households being served by water and acreage of land under irrigation being increased. This and other efforts have led to the Ministry's performance as evidenced by the 2020/21 ranking where it was ranked at position 6 out of 24 Ministries/Offices/Departments, with a score of 3.2454 (Good category) by the Ministry of Public Service and Gender.

During the year under review, the Ministry undertook post COVID-19 response works which was necessitated by the challenges faced by the Country due to the pandemic. The Ministry in collaboration with other Government and International Agencies continued the implementation of water projects to help contain spread of COVID-19. The World Bank supported the Ministry by granting Ksh 5 billion to support COVID-19 intervention measures, Japan International Cooperation Agency (JICA) bought chemicals worth Ksh 45 million while the Government of Kenya issued Ksh 200 million for chemicals and supported drilling and equipping of 50 boreholes in Nakuru County at a cost of 500 million.

In conclusion, we remain focused to realize the ultimate goal by His Excellency the President; our commitment is to implement projects, programmes and policies that will ensure increased provision of water and sanitation services, food and nutrition security and the realization of the "Big Four" Agenda besides the National Development Goals under Vision 2030, Sustainable Development Goal No.6 on Water and Sanitation and Goal No. 2 on Zero Hunger; and the African Agenda 2063..



**Mr. James W. Macharia, EGH**
**Ag. Cabinet Secretary**
**Ministry of Water, Sanitation and Irrigation**

# PREFACE



The Kenya Vision 2030 goal and SDG 6 on water and sanitation under the social pillar is to ensure universal access by 2030. Despite Kenya being a water scarce country, the Ministry has an obligation to put in place plans, systems and mechanisms to achieve gradual realization of the universal access to water and sanitation and food security. This can be achieved through increasing water harvesting and storage, sewerage system coverage, expansion of water supply networks, drainage and more irrigation schemes. In discharging its mandate, the Ministry is guided by key policy documents which include the Constitution of Kenya 2010, the Water Act 2016, Irrigation Act 2019, National Water Policy of 2021 and the Big Four Agenda among other subsidiary regulatory frameworks. These policies emphasize the need for efficiency and better management in the utilization of water, sanitation and irrigation resources to enable the government achieve its economic growth, food security and poverty reduction. The Sanitation Policy having been approved by the Cabinet is on its way to parliament.

In recognizing the challenges faced, the Ministry is fast-tracking the completion of Water and Sanitation projects. One of the major projects being undertaken is the Kenya Towns Sustainable Water and Sanitation program targeting rehabilitation and expansion of water and sanitation infrastructure in 28 towns across the country, connecting 2.1 million people to clean water and 1.3 million to sewer systems. Under the Program, a total of 8 projects have been completed which are to connect 360,000 and 275,000 people to water and sewerage systems respectively.

685 projects across the country that are intended to upscale access to water, sanitation and irrigation are in progress. The projects earmarked for completion in different parts of the country are; Northern Collector Water Extension project targeting to increase water in Nairobi by 140,000 cubic meters per day to serve an additional 1,200,000 people, Construction of new sewerage schemes in Chepareria, Mandera, Marsabit, Oyugis and Kapenguria. Others include; Embu Sewerage Project to improve sanitation in Embu town, Nyeri Sewerage Project to improve sanitation in Nyeri town, Garissa Sewerage Project, Mavoko Water Supply Project to serve 500,000 people in Mavoko area in Machakos County, Narok Sewerage Project, Oloitokitok Water and Sewerage Project to serve the people of Oloitokitok in Kajiado County. This is geared towards reducing the burden of Health budget, Human and Environment Health. Completion of these projects will be a key enabler for the attainment of the Government's Big Four Agenda as water is a principal component in all the elements of the agenda and also enable the country to achieve universal access to water and sanitation so as to improve human life and dignity as well as reducing the cost of health budget in treating water-borne diseases.

To upscale the country's irrigation capacity, the Ministry in the last one year has completed Kaigunji irrigation development project in Nyeri County benefiting 1,900 farmers, Kanini Irrigation Project in Tharaka Nithi County benefiting 100 farmers, Kiirua Buuri Irrigation Project in Meru County benefiting 2,000 farmers, and Nyanjigi Irrigation Development Project in Muranga County benefiting 1,000 farmers among others.

The Monitoring and Evaluation reforms which started under the Water Act 2002, and now the Water Act 2016 and Irrigation Act 2019, have brought great gains to the sector among them the separation of policy-making from regulation, and water services provision from water resources management and irrigation services; decentralization of key functions from the national level to the regional and county level; and a stronger pro-poor focus. The reforms have also enabled the sector to adopt the Human Right to Water as a guiding principle. The Ministry has established structures and platforms for increased stakeholder and consumer participation in decision-making and implementation processes, in an effort to combat the sector challenges.

Performance Contracting is part of the broader public sector reforms aimed at improving efficiency and effectiveness in the management of the Public Service since the year 2003. Since the year 2006, the Ministry has been implementing annual performance contracts and has greatly improved delivery of services to the citizens. The Performance Contracting is anchored on national development priorities such Medium Term Plans of Vision 2020, Big Four Agenda, Strategic Plans, SDGs among others. The Ministry's performance as evidenced by the FY 2020/21 ranking, was position 6 out of 24 Ministries/Offices/Departments, with a score of 3.2454 (Good category). In addition, one of our institutions (National Irrigation Authority) had a composite score of 1.889 (Excellent category) and was ranked position 1 nationally.

Finally, the Ministry is committed to enhance completion rates of all ongoing projects and programmes to increase water and sanitation coverage as well as food security. This will be achieved through strengthening performance measurement and management in implementation of project. In addition, synergies will be enhancing between Departments at the headquarters, Sector Institutions, other Government Agencies and key stakeholders in fast-tracking those projects which give maximum returns in short period of time. .

**Dr. Andrew Tuimur, CBS**
**Chief Administrative Secretary**
**Ministry of Water, Sanitation and Irrigation**

# ACKNOWLEDGMENT



This year's Annual Water Sector report comes at the backdrop of the end of MTP III and the Big Four Agenda period of the Jubilee Administration. The report, therefore, highlights the gains made by the Ministry towards realization of the commitments made by the government in the Water, Sanitation and Irrigation sector.

The access to water has increased from 65.5% to 70%, and urban sewerage from 27.7% to 31%, while the area under irrigation has increased from 552,000 acres to 664,000 acres during the last one year. The Ministry has completed the construction of Thiba dam which is set to stabilize supply of irrigation water for rice growing in Mwea Irrigation scheme, Yamo dam and Karimenu dam have also been completed. Relocation of water pipelines along the Nairobi Express Way have been successfully completed as part of the legacy projects under the Big Four Agenda. The Ministry is also set to commence the construction of Mwache and Soin koru dam while Thwake and Siyoi Muruny dam are at an advanced stage of construction.

Under the Big Four Agenda, the Ministry has been undertaking projects to supply water to sites identified by drivers including Special Economic Zones (SEZs) in Naivasha and Mombasa, Level 4, 3 and 2 hospitals across the country, housing projects in Nairobi and Athi River, three livestock holding grounds, two fish markets and three fish landing sites at the Coast. The Naivasha Industrial Park (Naivasha) and Dongo Kundu (Mombasa) water supply projects have been completed. Water connection to the livestock holding grounds, fish markets and fish landing sites at the Coast commenced in the 2021/2022 financial year and are ongoing. Under the Universal Health Coverage (UHC) Programme, 21 facilities have been connected with water from the initial target of 109 facilities. In addition, the Northern Corridor Tunnel is complete.

During the 4th and 5th wave of RRI, the Ministry was able to fast-track and complete 88 projects to serve additional 3,487,457 people with water and irrigation while 14,467 acres were brought under irrigation to benefit over 10,000 households. In addition, 50 water projects were undertaken to mitigate against the ravages caused by the COVID-19 pandemic.

Provision of safe and adequate water for all the citizenry still remains a challenge and a key government objective/priority going forward. The demand for water continues to rise due to the ever-growing national population, yet both surface and ground water levels continue to reduce as a result of climate change effects. In view of this, the Ministry is emphasizing on reducing Non-Revenue Water (NRW) losses, which is ultimately intended to translate to

much greater access to water services by Kenyans and increase revenue base for water utilities. The Ministry reiterates to continue providing accurate and reliable information during monitoring and reporting of the implementation of projects that would be relevant in guiding policy decisions in this critical sector.

To this end, I would like to express my sincere appreciation to the water, sanitation and irrigation sector players. Specifically, I wish to acknowledge the roles and contributions of all stakeholders, including our water sector institutions and technical staff in the provision of safe water, sewerage and irrigation services. I urge all sector stakeholders to own this third status report as it will inform some of the policy guidelines that will be issued by the Ministry from time to time for effective service delivery to the Kenyan citizens.

I wish to sincerely thank all those who participated in the preparation of this report. In particular, I would like to appreciate the invaluable contribution of the technical working group that was coordinated by the Water Secretary, with the assistance of the Irrigation Secretary, comprising of Eng. Patricia Kiarie, Rolex Kirui, Georgia Mwendwa Musau, Nancy Koech, Daniel Odero, Esther Musavi, Stephen Ogelo, Chrysostome Njeru, Derrick Ojuku, Heads of the Departments in the Ministry and Chief Executive Officers of the State Corporations. I also wish to appreciate the office of the Cabinet Secretary and Cabinet Administrative Secretary for providing leadership and direction on the preparation of this third annual status report



**Dr. (Eng.) Joseph K. Njoroge, PhD, CBS**
**Ag. Principal Secretary**
**Ministry of Water, Sanitation and Irrigation**

# REMARKS - WATER AND SANITATION DIRECTORATE



The Ministry's objective is to ensure every person has right to access to clean and safe water in adequate quantity, reasonable standards of sanitation and free from hunger and have adequate food of acceptable quality as anchored in the Constitution. Water is an important natural resource to all forms of life and their existence and is an essential prerequisite for inclusive economic growth, poverty reduction and sustainable social-economic development geared towards the realization of the Kenya's Vision 2030, Sustainable Development Goals (SDGs) and the Big 4 Agenda. The directorate of Water and Sanitation under the guidance and support of the Cabinet Secretary and Principal secretary made remarkable achievements.

On implementation of various programmes, the Ministry has increased water coverage by 10.1% from 59.9% in 2017 to 70.0% in 2022 while sewerage coverage in urban areas increased by 5% from 26.1% in 2017 to 31% in 2022.

In order to make the rain water available for human consumption and environmental conservation, The Ministry has completed and commissioned Yamo dam in Samburu County and Karimenu dam in Kiambu County. Construction of Thiba Multipurpose dam with a dam capacity of 15.5 million cubic meters of water is also complete. Other multipurpose dams are at an advanced stage; Thwake (72%) in Kitui/Makueni Counties, Ruiru II (7.5%) in Kiambu County, Mwache (6%) in Kwale/Mombasa County, Siyoi-Muruny (65%) in west Pokot County and Soin-Koru Multipurpose dam (5%). Once all the dams are completed, additional 839.8 million of water will be realized. During the period under review, the Ministry also constructed 67 pans/small dams with a total water storage capacity of 0.5 million cubic meters across the counties.

Kenya Towns Sustainable Water and Sanitation program targeting rehabilitation and expansion of water and sanitation infrastructure in 28 towns across the country, connecting 2.1 million people to clean water and 1.3 million to sewer systems has attained a progress of 65% with 8 projects completed.

Currently, the Proportion of Non-Revenue Water (NRW) stands at 45%. The Ministry targets to achieve 20% levels of NRW by 2030 through capacity building to develop policies and increase investment in reduction of NRW. Also, Preparations are ongoing to disseminate for implementation the Non-Revenue Water Management Standards in all the 47 Counties.

Under the Big Four Agenda, the Ministry has been undertaking projects to supply water to sites identified by drivers. The Naivasha Industrial Park (Naivasha) and Dongo Kundu

(Mombasa) water supply projects have been completed. Water connection to the livestock holding grounds, fish markets and fish landing sites at the Coast commenced in the 2021/2022 financial year and are ongoing. Under the Universal Health Coverage (UHC) Programme, 21 facilities have been connected with water out of the target 109.

Water and Sanitation Development (WSDP) project has physical progress of 31%. The total project Cost is USD 330 Million and is aimed at improving access to water services for approximately 2.02 million people by rehabilitating and expanding urban water supply and sanitation services in the coastal region and marginalized North- eastern Counties of Kenya. In addition, it will improve the financial performance of Water Service Providers affected by Covid-19 Pandemic.

To fast track on project and programmes implementation, The Fourth and Fifth wave of 100 days Rapid Result Initiative (RRI) was undertaken. The Fourth wave was done between August and November 2021 and involved completion of 20 projects, fast tracked to achieve 100% completion and serving a population of 34,429 households and increased area under irrigation by 6,210 acres and fast tracking legal, institutional and policy reforms. The fifth wave of 100 days Rapid result initiative (RRI) commenced in February 2022 and ended in May 2022 . So far 31 out of 109 projects have achieved 100% completion, this saw additional 40,422 households served with water and 10,000 acres under irrigation. We are at an advance Stage to progress projects implementation through Public Private Partnerships (PPPs), this includes Maragua 4 dams and Ndaruga Dam.

Finally, On the Water sector investment plan, the Ministry is to prepare the National Water and Sanitation Investment Program financing plan that will facilitate implementation of an aggregated 2,742 projects from the 47 counties targeting to achieve Universal coverage by 2030.

The Ministry in improving on management and development of Water resources and sanitation, developed Key Policy documents including the National Water Policy of 2021 which has been operationalized and Water Act (Amendments) Bill aimed at bridging gaps and addressing inconsistencies in Water Act, 2016. Draft Sanitation policy has been approved by the Cabinet and it is on its way to Parliament. Also, Water and Sanitation Strategy, Water Resources Management Strategy and Water Harvesting and Storage Strategy have been published.



**Eng. SAO Alima**
**Water Secretary**
**Ministry of Water, Sanitation and Irrigation**

# REMARKS - IRRIGATION DIRECTORATE



The Kenya Government recognizes the importance of developing resilient food production systems and the fact that irrigated agriculture presents the best opportunity to absorb shocks presented to these production systems. This has been well articulated in the long term as well as short term development plans and is best illustrated in goals outlined in the Vision 2030 development blueprint and the BIG 4 agenda.

The Kenya Vision 2030 seeks to exploit the Irrigation potential by increasing the area under irrigation by 1.2 million acres across the country by the year 2030 whereas the BIG 4 agenda recognize Irrigation as a key enabler to agricultural growth and sustainability. In 2021/22 the government allocated Kes 14.844 billion towards irrigation & land reclamation; and Water harvesting & storage for irrigation.

During the year under review the directorate of irrigation under the guidance and support of the Cabinet Secretary and Principal secretary made remarkable achievements. These included; Completion of Thiba dam under the Mwea irrigation development project. The dam is expected to store 15.5 million Cubic metres of water that will expand the area under irrigation from 25,000 to 35,000 acres for rice production.

The ministry has so far constructed 28,732 household water pans in 31 counties with a combined potential volume of 39.9 million cubic meters in arid areas to irrigate about 38,904 acres and benefitting 28,732 households. In order to provide water and food security for schools, the Ministry constructed 63 green houses and drilled and equipped 81 boreholes complete with 20,000-litres raised tanks to supply water to 120 public schools to support the old 4K clubs to begin commercial irrigation using drip irrigation in the greenhouses.

63,342 acres of land have been developed under public schemes contributing an average 170,000 tons of rice annually and Ksh. 151 billion in value of horticultural produce for export. In addition;19,000 acres of land were developed in Turkana to benefit 9,080 households and provide a stable supply of food at an average of 38,000 tons of maize and millet.

240 irrigation projects were constructed through National Expanded Irrigation Programme and Community Based Smallholder irrigation across all the 47 Counties with a cumulative area of 236,866 acres directly benefiting over 267,426 farmers.

The total area under irrigation due to the above interventions increased from 458,630 acres in 2016/17 to 664,000 acres in 2021/22.

Finally, to inform land reclamation interventions and attain land degradation neutrality the directorate carried out three basin-based land degradation assessments for Lake Magadi, Upper Kerio Valley and Upper Ewaso Nyiro North basins.

An enabling environment is key in irrigation development and land reclamation interventions. The ministry developed Regulations and Strategies to create this environment of irrigation development for ultimate realization of food security in the country. These included; Gazettment of the Irrigation (General) Regulations 2021; and the formulation of National Irrigation Service Strategy (NISS) 2022-2026. In addition,7 training manuals for Irrigation Water user Associations (IWUAs) were developed and published.

Several other reforms were undertaken by the directorate such as development of frameworks for establishment of County Irrigation Development Units (CIDUs) and for establishment of an Irrigation Research Institution. The draft Procedures and Instrument for Handing Over Irrigation and Land Reclamation projects was also developed and approved by the Attorney General for gazettement.



**Mr. Aboud Moeva**
**Irrigation Secretary**
**Ministry of Water, Sanitation and Irrigation**

# CONTENTS


FOREWORD ..... iii
PREFACE ..... vi
ACKNOWLEDGMENT ..... viii
REMARKS - WATER AND SANITATION DIRECTORATE ..... x
REMARKS - IRRIGATION DIRECTORATE ..... xii
LIST OF FIGURES ..... xvii
LIST OF TABLES ..... xviii
ACRONYMS ..... xix
EXECUTIVE SUMMARY ..... xxi

1.0 INTRODUCTION ..... 1

2.0 SITUATION ANALYSIS ..... 4

2.1 Highlights of Significant Achievements ..... 4
2.1.1 Policy and Legal framework ..... 4
2.1.2 Projects and Programmes Implementation ..... 5
2.1.3 Rapid Results Initiative ..... 7
2.1.4 Development of MTP IV Plan (2023-2027) ..... 8
2.2 Regulatory Frameworks .....
2.2.1 Water Act 2016 ..... 8
2.2.2 Irrigation Act 2019 ..... 8
2.2.3 Hydrologists Act 2017 ..... 8
2.2.4 KEWI Act 2001 ..... 9
2.2.5 RCGW Legal Notice No. 252 ..... 9
2.3 Status of Human Resources .....
2.3.1 Human Resource at the Ministry Headquarters ..... 10
2.3.2 Human Resource in the Water Sector Institutions ..... 11
2.3.3 Achievements in Human Resources ..... 12
2.4 Post-Covid-19 Response Works .....
2.5 Sector Financing ..... 13
2.5.1 Sector Investment Plan ..... 14
2.6 Status of Water Resources ..... 14
2.6.1 Overview of water resources ..... 14
2.6.2 Water Resources Management ..... 16
2.6.3 Water Resources Availability ..... 18
2.6.4 Water Use ..... 22
2.6.5 Water Resources Monitoring ..... 24
2.6.6 Catchment Protection and Conservation ..... 31
2.6.7 Water Resources Management intervention measures ..... 31

2.6.8 Transboundary Water Resources....32
2.6.9 Water Resources Management Projects/Programmes....36
2.7 Status of Water Supply and Sewerage....38
2.7.1 Introduction....38
2.7.2 Analysis of Water Supply and Sanitation Projects in the Ministry....40
2.7.3 Projects under the Big Four....40
2.7.4 Trend in Water Coverage;....42
2.7.5 Trend in Sewerage Coverage....46
2.7.6 Projected Water and Sewerage Coverage....46
2.8 Status of Sanitation....49
2.9 Status of Irrigation and Land Reclamation....50
2.9.1 Irrigation....50
2.9.2 Land Reclamation....59
2.10 Monitoring, Evaluation and Reporting....66
2.11 Performance Contracting....67

3.0 CHALLENGES, LESSONS LEARNT AND EMERGING ISSUES....69
3.1 Lessons Learnt....69
3.2 Key Challenges....70
3.3 Emerging Issues....71

4.0 CONCLUSION AND RECOMMENDATIONS....72

ANNEXES....73
Annex I: Projects Completed in the Last Ten Years in WWDAs....73
Annex II: Projects Projected to be completed by 2022....84
Annex III: Irrigation Projects expected to be Completed by 2022....99
Annex IV: Details of Dams....102
Annex V: Projects under the Big 'Four" Agenda....107
Annex VI: Proposed Large Scale and Strategic Irrigation Projects....120
Annex VII: List of Weather Stations configured to transmit data to WRA server....133

# LIST OF FIGURES


Figure 1: Trends in the Water, Sanitation and Irrigation Sector Financing from 2013/14 to 2021/22 Financial Years....14
Figure 2: Map of boreholes spatial distribution and sub basin delineations across the country....20
Figure 3: Groundwater balance map of Kenya with an overlay of aquifer boundaries....21
Figure 4: Groundwater applications and approvals from the year 2004 – 2022....22
Figure 6: Rainfall monitoring network....26
Figure 7: Screenshot of WRA FTP server with weather station telemetry data....27
Figure 8: Display of Telemetric Stations on WRA Web Portal and Sagana State Lodge Weather Station data....27
Figure 8: The map of Athi river Basin showing Athi and Thwake rivers amongst other attributes....29
Figure 9: Myriad and uncontrolled wastewater channels in the Mlololongo Highrise residential buildings....29
Figure 10: Water quality and pollution monitoring upstream of Athi/Thwake rivers confluence....30
Figure 11: Transboundary water resources in Kenya....35
Figure 12: Comparison of water coverage by various WWDAs for the last 5 years....44
Figure 13: Trend of national water coverage for the last 5 years....45
Figure 14: Projected Water coverage to be achieved on or before year 2026....47
Figure 15: Projected Sewerage coverage to be achieved on or before 2026....48
Figure 16: Opportunities for irrigation investments....50
Figure 17: Land Degradation Assessment {LADA); Kenya -2012....60
Figure 18: Upper Kerio Valley Land Degradation Status 2020....61
Figure 19: Upper Ewaso Nyiro North Land Degradation Status 2020....62
Figure 20: Highly degraded land at Mtembur in West Pokot County....63
Figure 21: Jila water pan in Ganze Constituency, Kilifi County used to put unproductive land under production for both crops and livestock production....63
Figure 22: Bare wasteland reclaimed in Wajir County....64
Figure 23: Nyaoroko Pan in Gilgil, Nakuru County where Land Waste is high but 60 acres of land have been reclaimed....64
Figure 24: Kamelil dam in Keiyo north where unproductive land is being utilized for vegetable production....65
Figure 25: Kabinat water pan in Baringo Central where unproductive land has now been put under production through micro-irrigation....65
Figure 26: Land in Turkana County under reclamation....66

# LIST OF TABLES


Table 1: Current staffing levels per approved departments ..... 10
Table 2: A Summary of Human Resources in Water Sector Institutions ..... 11
Table 3: Renewable and Available Water Resources ..... 18
Table 4: Summary of Groundwater Use Balance by Basin ..... 19
Table 5: Surface Water Monitoring Stations and Operational Status ..... 24
Table 6: Weather monitoring network ..... 25
Table 7: National Water Quality Monitoring Stations ..... 28
Table 8: Population and percentage coverage for WWDAs for the last 6 years ..... 43
Table 9: Population and percentage Water coverage by Waterfund Rural Marginalized/ Underserved and Urban Poor in the last 5 years ..... 46
Table 10: Population reached with sanitation services by Water fund in rural marginalized/ underserved areas and urban poor ..... 49
Table 11: Summary for irrigation Projects ..... 58
Table 12: Summary for Water Harvesting Projects ..... 58
Table 13: Summary for irrigation and water harvesting projects ..... 59

# ACRONYMS

| | |
|---|---|
| ACA | Athi Catchment Area |
| AfDB | Africa Development Bank |
| AG | Attorney General |
| AWWDA | Athi Water Works Development Agency |
| AMCOW | African Ministers' Council on Water |
| ASALs | Arid and Semi-Arid Lands |
| BADEA | Arab Bank for Economic Development in Africa |
| BCM | Billion Cubic Metres |
| BWRCs | Basin Water Resources Committees |
| CAACs | Catchment Advisory Committees |
| CEO | Chief Executive Officer |
| CBO | Community Based Organization |
| CoK | Constitution of Kenya |
| COVID | Corona Virus Disease |
| CWWDA | Coast Water Works Development Agency |
| EAC | East African Community |
| ECDPs | Effluent Discharge Control Plans |
| ENNCA | Ewaso Ng'iro North Catchment Area |
| GDP | Gross Domestic Product |
| GHRIS | Government Human Resource Information System |
| GOK | Government of Kenya |
| GIS | Geographic Information System |
| HYCOS | Hydrological Cycle Observing System |
| IGAD | Intergovernmental Authority on Development |
| IHP | International Hydrological Programme |
| IWRM | Integrated Water Resources Management |
| KEWI | Kenya Water Institute |
| KFS | Kenya Forest Service |
| KfW | German Development Bank |
| LADA | Land Degradation Assessment |
| LDN | Land Degradation Neutrality |
| LVNCA | Lake Victoria North Catchment Area |
| LVNWWDA | Lake Victoria North Water Works Development Agency |
| LVSCA | Lake Victoria Catchment Area |
| LVSWWDA | Lake Victoria South Water Works Development Agency |
| MAR | Managed Aquifer Recharge |
| MCM | Million Cubic Metres |
| MoUs | Memorandum of Understandings |
| MW | Mega Watts |
| NAS | Nairobi Aquifer Suite |

| | |
|---|---|
| NBI | Nile Basin Initiative |
| NDICCC | National Development Implementation and Communication Cabinet Committee |
| NIA | National Irrigation Authority |
| NMS | Nairobi Metropolitan Services |
| NRW | Non-Revenue Water |
| NRWWDA | North Rift Water Works Development Agency |
| NWCPC | National Water Conservation and Pipeline Corporation |
| NWHSA | National Water Harvesting and Storage Authority |
| NWMP2030 | National Water Master Plan 2030 |
| NWRS | National Water Resources Strategy |
| PSC | Public Service Commission |
| PPPs | Public Private Partnerships |
| RCGW | Regional Centre on Groundwater |
| RCMRD | Regional Centre for Mapping of Resources for Development |
| RQOs | Resource Quality Objectives |
| RRI | Rapid Results Initiative |
| RVCA | Rift Valley Catchment Area |
| SAGA | Semi-Autonomous Government Agency |
| SDGs | Sustainable Development Goals |
| SCMPs | Sub catchment Management Plans |
| SEZ | Special Economic Zone |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| USD | United States Dollar |
| USGS | United States Geological Survey |
| WAB | Water Appeal Board |
| WASREB | Water Services Regulatory Board |
| WRA | Water Resources Authority |
| WRMA | Water Resources Management Authority |
| WRUAs | Water Resource Users Associations |
| WSB | Water Services Board |
| WSPs | Water Service Providers |
| Waterfund | Water Sector Trust Fund |
| WT | Water Tribunal |
| WWDAs | Water Works Development Agencies |

# ACRONYMS

| | |
|---|---|
| ACA | Athi Catchment Area |
| AfDB | Africa Development Bank |
| AG | Attorney General |
| AWWDA | Athi Water Works Development Agency |
| AMCOW | African Ministers' Council on Water |
| ASALs | Arid and Semi-Arid Lands |
| BADEA | Arab Bank for Economic Development in Africa |
| BCM | Billion Cubic Metres |
| BWRCs | Basin Water Resources Committees |
| CAACs | Catchment Advisory Committees |
| CEO | Chief Executive Officer |
| CBO | Community Based Organization |
| CoK | Constitution of Kenya |
| COVID | Corona Virus Disease |
| CWWDA | Coast Water Works Development Agency |
| EAC | East African Community |
| ECDPs | Effluent Discharge Control Plans |
| ENNCA | Ewaso Ng'iro North Catchment Area |
| GDP | Gross Domestic Product |
| GHRIS | Government Human Resource Information System |
| GOK | Government of Kenya |
| GIS | Geographic Information System |
| HYCOS | Hydrological Cycle Observing System |
| IGAD | Intergovernmental Authority on Development |
| IHP | International Hydrological Programme |
| IWRM | Integrated Water Resources Management |
| KEWI | Kenya Water Institute |
| KFS | Kenya Forest Service |
| KfW | German Development Bank |
| LADA | Land Degradation Assessment |
| LDN | Land Degradation Neutrality |
| LVNCA | Lake Victoria North Catchment Area |
| LVNWWDA | Lake Victoria North Water Works Development Agency |
| LVSCA | Lake Victoria Catchment Area |
| LVSWWDA | Lake Victoria South Water Works Development Agency |
| MAR | Managed Aquifer Recharge |
| MCM | Million Cubic Metres |
| MoUs | Memorandum of Understandings |
| MW | Mega Watts |
| NAS | Nairobi Aquifer Suite |

| | |
|---|---|
| NBI | Nile Basin Initiative |
| NDICCC | National Development Implementation and Communication Cabinet Committee |
| NIA | National Irrigation Authority |
| NMS | Nairobi Metropolitan Services |
| NRW | Non-Revenue Water |
| NRWWDA | North Rift Water Works Development Agency |
| NWCPC | National Water Conservation and Pipeline Corporation |
| NWHSA | National Water Harvesting and Storage Authority |
| NWMP2030 | National Water Master Plan 2030 |
| NWRS | National Water Resources Strategy |
| PSC | Public Service Commission |
| PPPs | Public Private Partnerships |
| RCGW | Regional Centre on Groundwater |
| RCMRD | Regional Centre for Mapping of Resources for Development |
| RQOs | Resource Quality Objectives |
| RRI | Rapid Results Initiative |
| RVCA | Rift Valley Catchment Area |
| SAGA | Semi-Autonomous Government Agency |
| SDGs | Sustainable Development Goals |
| SCMPs | Sub catchment Management Plans |
| SEZ | Special Economic Zone |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| USD | United States Dollar |
| USGS | United States Geological Survey |
| WAB | Water Appeal Board |
| WASREB | Water Services Regulatory Board |
| WRA | Water Resources Authority |
| WRMA | Water Resources Management Authority |
| WRUAs | Water Resource Users Associations |
| WSB | Water Services Board |
| WSPs | Water Service Providers |
| Waterfund | Water Sector Trust Fund |
| WT | Water Tribunal |
| WWDAs | Water Works Development Agencies |

# EXECUTIVE SUMMARY

This annual report is a detailed assessment status of the water, sanitation and irrigation sector for the year 2021. The report prepared during post covid-19 phase provides the Ministry situation analysis with highlights of the key achievements, challenges, lessons learnt, emerging issues and recommendations. The key projects including the "Big Four' to be implemented in the medium-term period are also outlined in the report.

During the review period, the Ministry implemented major projects under the following five categories: General administration, planning and support services, water resource management, water and sewerage infrastructure development, irrigation and land reclamation, water harvesting and storage.

Under policy and legal framework, the Ministry finalized the National Water Policy of 2021. The Sanitation Policy has been approved by Cabinet and is on its way to Parliament. Transboundary Water Policy and Bill are at the stakeholder's participation level. The Water Act (Amendments) Bill which aims at bridging gaps and addressing inconsistencies in Water Act, 2016 is still under formulation. The Water Services Regulations, Water Harvesting and Storage Regulations, Water Resources Regulations, and Irrigation (General) Regulations 2021 has been finalized and published. The Ministry also finalized publication of the Irrigation Guidelines and the draft Procedure and Instrument for Handing Over Water, Sanitation, Irrigation and Land Reclamation projects was finalized.

During the review period, Water, Sanitation and Irrigation strategies were also finalized and published. The frameworks for establishment of County Irrigation Development Units (CIDUs) and one for establishment of an Irrigation Research Institution was developed. The Ministry also undertook stakeholder sensitization and dissemination of policies and strategies namely: the National Water and Sanitation Strategy 2020-2025, The National Water Harvesting and storage Strategy 2020-2025 and the National Water Resources Strategy 2020-2025.

In line with implementation of the Water Act, the Ministry undertook Asset and Liabilities verification exercise resulting in a comprehensive consolidated report from all the Agencies which is currently being validated by a consultant before its Gazettement as required by the Act. In addition, handing over instruments have been developed as per the requirement of Article 69 of Water Act 2016 and have been forwarded to AG for concurrence before publication.

On the implementation of programmes, the Ministry increased water coverage from 53.3% in 2013 to 70% in 2022 while sewerage coverage in urban areas increased from 22.1% in 2013 to 31% in 2022. To achieve universal access by the year 2030, a road map was developed to undertake key projects and programs that will connect 200,000 people to water and 350,000 to sewerage system annually throughout the country. To progressively achieve the right to clean and safe water in adequate quantities among the people of Kenya and ensure no

Kenyan is left behind, thirty-eight (38) water projects and four (4) sewerage projects were completed during the period under review. During the same period, a total of five projects were started with four being water projects and one being protection works at Upper Tana Natural Resource Management Program.

The Kenya Towns Sustainable Water and Sanitation Programme, which envisions to connect 2.1 million people to clean water and 1.3 million people to sewer systems is a five-year programme that began in 2017 and is now at an average progress of 65%. A total of eight (8) projects have been complete with four (4) being completed during the review period: Chogoria water supply, Pemba intake Water Supply, Malaba Sewerage and Othaya sewerage project.

On water harvesting and storage, the Ministry has completed and commissioned Karimenu dam and Yamo dam. The Ministry is also fast tracking the completion of the following dams: Ruiru II in Kiambu, Thwake dam (72%) in Kitui/Makueni, Mwache Dam in Kwale/Mombasa (Survey and mobilization works in progress), Siyoi-Muruny Dam and Water Supply in West Pokot County (65% progress). The Ministry also identified and constructed three peace dams namely Kases in West Pokot, Forolle in Marsabit and Naku'etum in Turkana.

On Irrigation programme, the Ministry developed 112,000 acres under public schemes and community-based smallholder irrigation schemes contributing an average 170,000 tons of rice, 17,000 tons of maize and Ksh. 151 billion in value of horticultural produce for export annually, directly benefiting over 267,426 farmers. Further, the Ministry constructed 28,732 household water pans by end of June 2022 across 31 counties with a combined potential volume of 39.9 million m3 of storage to irrigate about 38,904 acres of land.

On 12th May, 2021, the Ministry received an approved Organization Structure and Staff Establishment from Public Service Commission which revised the current Authorized staff Establishment to 430. The Ministry's current total number of staff is 581 resulting in a variance of 151 staff. Out of the 581 in post, technical departments constitute 51.8 % of staff while shared services is 48.2%. In the Water Sector Institutions, the total authorized establishment is three thousand and fifty-seven (3,157) employees against an in post of two thousand and three (2,003) giving a variance/ gap of one thousand one hundred and fifty-four (1,154). To enhance human resources capacity and development, the Ministry during the review period recruited 72 new staff, 114 officers promoted and trained 40 staff in various institutions for both short term and long courses.

The Water, Sanitation and Irrigation Sector budgetary allocation has tremendously increased from Ksh.. 38.2 billion in the financial year 2013/2014 to Ksh.. 70.6 billion in the financial year 2021/22 translating to an overall percentage increase of 84%. During the same period, the expenditures has also increased from Ksh. 26 billion to Ksh. 64.2 billion translating an overall percentage increase of 147%. Further, the budget absorption rates in the same period has increased from 68% to 91%.

The Ministry in efforts to aggregate the resource mobilization strategies by the national government and County development plans for Water and Sanitation, the Ministry held a stakeholder consultation with all the 47 counties and a total of 2742 projects meant to achieve Universal coverage by 2030 aggregated to form The National Water and Sanitation Investment Program (NAWASIP). The Ministry is to prepare NAWASIP financing plan.

Despite these achievements, there were some challenges faced during the review period that include; High Cost of Resettlement Action Plan (RAP), investment in the water sector not matching population growth, the Ministry's planned projects and programmes have been greatly impacted by COVID- 19 pandemic, no funds allocated for maintenance of water supplies and sanitation facilities leading to dilapidated infrastructure unable to serve the expected population, pollution of Water resources: the low sewerage coverage poses a major threat to water quality and public health, largely due to inadequate effluent treatment, low Capacity of farmers in irrigation farming and overall governance/management of irrigation schemes, Land reclamation mandate is not clearly stipulated as a national government or county government function rendering effective implementation of land reclamation projects and programmes difficult, high energy cost of water production impeding affordability of water, pending appeal at PSC on organization structure- there is need for engaging the PSC for a final outcome on pertinent issues that the Ministry raised on the same, the Ministry faces an aging workforce yet the rate of replacement/appointment is very low leading to a low staff strength that adversely affects service delivery and inadequate training budget which often faces budget cuts thus hindering staff development and subsequent career stagnation.

A number of lessons were also learnt, these were: need for continuous engagement of Parliament and National Treasury to enhance communication with project implementation agencies and grant exemption from remission of duty and taxes, collaborative framework between the National and County governments is essential for sustainable: water resource, water, sanitation, land reclamation and irrigation management, water and sewerage projects completed and transferred in the last five years have had minimal impact due to low household connections hence household connectivity should be incorporated during planning stage, adoption of advance techniques is essential to map and access large ground water resources, financing of irrigation development through cost sharing model with project beneficiaries improves: the rate of irrigation development, ownership and sustainability, adoption of climate smart irrigated agriculture, collection and timely dissemination of climate related data as well as capacity building of famers and technical officers, they is need to undertake studies on water-energy nexus to map the progressive energy cost of water and also adopt energy efficiency technology to reduce energy cost of water, multi-agency approach with relevant stakeholders on security of critical water and irrigation infrastructure is essential.

The Ministry has put in place mechanisms to overcome these challenges by finalization of the National Water Policy of 2021 and National Irrigation policy and Management. The

sanitation Policy has been approved by Cabinet and is on its way to Parliament. Finalization and publication of the statutory instruments governing the water and irrigation sector: Water Services Regulations, Water Harvesting and Storage Regulations, Water Resources Regulation and Irrigation (General) Regulations 2021.

To address the inadequate financial resources, the Ministry held a stakeholder consultation with all the 47 counties and a total of 2,742 projects meant to achieve Universal water coverage by 2030 aggregated to form the National Water and Sanitation Investment Program (NAWASIP). The Ministry is to prepare NAWASIP financing plan that will inform engagement with development partners.

# 1.0 INTRODUCTION

The Ministry of Water, Sanitation and Irrigation was formed after the merger of the former Ministry of Water and Sanitation and the State Department for Irrigation through Executive Order No. 6 of 22nd August 2019. The mandate of the Ministry was further revised through the Executive Order No. 1 of 2020 issued on 14th January, 2020 (Revised). The Ministry's mandate is guided by key laws and policies as provided by the Constitution of Kenya 2010, Water Act 2016, Irrigation Act 2019, Kenya Water Institute (KEWI) Act 2001, legal notice number 252 of 2015, Agenda 2063, SDGs No. 2, 6, and 15, Kenya Vision 2030, MTP III (2018-2022), and the 'Big four' agenda. The Ministry faces a number of global, regional and national challenges that include: climate change, rapid technological advancement, covid-19 global pandemics, transboundary water resource issues, population growth, human settlements, poverty, pollution, acquisition of land to implement projects and degradation of catchment areas.

The Ministry's mandate is to develop policies and strategies to protect, conserve, and manage Water Resources, achieve progressive realization to right to water, sanitation and food security in accordance with article 43(b) (c) and (d) of the constitution for socio-economic development of the Nation. In addition, it is also mandated to offer consumer protection to water users, hydraulic engineering, sector coordination and resource mobilization. The functions of the Ministry are: Water Resources Management Policy, Water and Sewerage Services Management Policy, Waste Water Treatment and Disposal Policy, Water Catchment Area Conservation, Control and Protection, Water Quality and Pollution Control, restoring the rivers and lakes water balance, Sanitation Management of Public Water Schemes and Community Water Projects, Water Harvesting for Domestic and Industrial Use and Flood Control Management; National Irrigation policy and Management; Management of Irrigation schemes; Mapping, Designating and Developing areas ideal for irrigation schemes; and Water harvesting and storage for irrigation. This mandate is guided by laws and policies which emphasize the need for efficiency and better management in the utilization of natural resources to enable the government achieve its strategic goals of economic growth, poverty reduction and social stability.

Water is an important natural resource to all forms of life and their existence and is an essential prerequisite for inclusive economic growth, poverty reduction and sustainable socio-economic development. Sustainable use and management of water resources is key to the successful implementation of the Country's development agenda and achieving sustainable development goals.

Sustainable water resources use and management is key to successful implementation of the national development agenda. With Kenya classified as a water scarce country while recognizing water as a key driver of all sectors of the economy, water requires serious attention and in particular allocation of the resources necessary for its management and

development. However, allocation of enough resources for the water resources sector has been a challenge. Provision of adequate resources to this sector will also ensure the country realizes the benefits of the 'Big Four Agenda'. It will also lead to the achievement of the Kenya Vision 2030 development agenda under the social pillar on attainment of universal access to water by 2030 and the economic pillar on food security. Further, it will assist in achievement of Sustainable Development Goals, especially Goal No. 6 on "Ensuring Availability and Sustainable Management of Water and Sanitation for all" in which the sector is targeting to increase the percentage of national population with access to safe water from 70% in 2022 to 100% by 2030. The sector also targets to increase the percentage of the national population with access to sewerage from 31% in 2022 to 100% by 2030. Further, it will contribute towards achieving SDG 2 on hunger; food security and agriculture through implementation of livelihood enhancement activities. Provision and allocation of water for irrigation development will be key in the attainment of this goal. Similarly, conservation and protection of riparian land in Kenya has become increasingly important. This is in order to secure our water bodies from encroachment and pollution which have become serious threats in the recent past. On the same note, it is important that safety and stability of our water infrastructure is ensured. A total of 144 critical catchment areas were identified for gazettement. Management plans for Dik-dik wetlands, lamu sand-dunes and Kikuyu ground water conservation areas were developed. Regulating the development of the infrastructure is a matter of priority for the sustainability of investments.

Furthermore, enhancing the quality and utility of a country's water information including water monitoring and data collection network; restoring the water catchment areas including the aquifers for water balance; restoring the river basins water balance; reducing pollution levels and enhancing water quality must be a matter of priority. There is need to support water resources programmes as this will create an enabling environment for other sectors to grow and also minimize the water scarcity shocks. The reliability and access to water resources is a fundamental human right under the economic and social rights Article 43, (1), (d), to clean and safe water in adequate quantities and the state has the obligation under the constitution to preserve and ensure the right is achieved. The well managed water resources will enhance the country's negotiating position with the other riparian countries on equitable sharing of transboundary resources will assist the country in negotiating with other countries that share trans-boundary waters. Further, the cost for water infrastructure development and maintenance will reduce significantly due to improved quality and quantity of water

In addition, it is important to note that water sources are not only affected by poor land use and land management practices but land degradation also cause an estimated annual economic loss of about 3% to the national GDP or about USD 390million annually (MTP 2008-2012). Land waste leads to dam siltation that is the norm in Kenya. GIS and remote sensing data (2012) obtained over a period of 20 years indicate, there is a serious and increasing level of severity of land degradation and land waste that is affecting the capacity of Kenya's land to conserve, store and release water resources sustainably thereby compromising water security, land productivity and increasing conflict among communities. Therefore, this calls for additional resources to achieve Sustainable Development Goal No. 15 to halt and reverse

land degradation and target to achieve Land degradation Neutrality (LDN) by 2030.In the period under review land degradation assessments were done at upper Kerio Valley and Upper Ewaso Nyiro north basins to inform Land reclamation interventions.

Irrigation is a major contributor to achievement of food security for Kenya as well as improving peoples' livelihoods and economic welfare. The irrigation potential is estimated at 1.913million acres (765,575 ha) as per the National Water Master Plan 2030 without water storage and can go up to 3 million acres (1.2 million ha). The total area under irrigation increased from 552,000 acres in 2020/21 to 664,000 acres in 2021/22 accounting for 35% coverage while out of the country's total arable land only 5.9% is equipped with irrigation infrastructure. This calls for concerted efforts towards increasing access to agricultural water in a bid to increase yield to support food and nutrition security efforts and support growth in manufacturing vide agro-processing of surplus produce and value addition.

After the promulgation of the Constitution of Kenya, 2010 there was need to align the Water Act 2002 to the new law (Water Act, No. 43 of 2016). This was mainly due to the introduction of devolved units (counties) to replace the earlier provinces and districts. The counties were given the responsibility of services delivery while the National Government retained the role of water resources conservation and management and infrastructure development. The Ministry developed and enacted Water Act 2016 to repeal Water Act 2002. The Water Act 2016 Section 10 (4) and Irrigation Act 2019 Section 6(2h) states that the Cabinet Secretary shall prepare and issue an annual report on the state of national water resource strategies and needs for Irrigation development and management in Kenya. This report is for the Financial Year 2021/2022 and it is the third Annual Status Report.

# 2.0 SITUATION ANALYSIS

The Ministry implemented five programmes during the period under review;

General administration, planning and support services; Water resources management; water and sewerage infrastructure development; Irrigation and land reclamation; water harvesting and storage.

## 2.1 Highlights of Significant Achievements

The following are the achievements for the last one year;

### 2.1.1 Policy and Legal framework

The Ministry completed the development and gazettement of Water Services Regulations, Water Harvesting and Storage Regulations, Water Resources Regulations and Irrigation (General) Regulations 2021. The Water Act (Amendments) Bill aimed at bridging gaps and addressing inconsistencies in Water Act, 2016 is still under formulation while KEWI Bill is under review.

During the review period, the Ministry also undertook stakeholder sensitization and dissemination of policies and strategies namely: the National Water and Sanitation Strategy 2020-2025, The National Water Harvesting and storage Strategy 2020-2025 and the National Water Resources Strategy 2020-2025.

On the implementation of the Water Act, the Ministry undertook Asset and Liabilities verification exercise resulting in a comprehensive consolidated report from all the Agencies which is currently being validated by a consultant before its Gazettement as required by the Act. In addition, handing over instruments have been developed as per the requirement of Article 69 of Water Act 2016 and have been forwarded to AG for concurrence before publication. Also, transboundary water policy and bill are at the stakeholder's participation level.

The Ministry developed Key Policy documents including the National Water Policy of 2021 which has been operationalized; Draft Sanitation policy which has been developed and a stakeholder consultation done.

The National Irrigation Services Strategy (NISS) 2022-2026 has been finalized and published. The Irrigation (General) Regulations 2021 was gazetted and draft frameworks for establishment of County Irrigation Development Units (CIDUs) and an Irrigation Research Institution developed. The draft Procedure and Instrument for Handing Over Irrigation and Land Reclamation projects was approved by the AG for gazettement.

### 2.1.2 Projects and Programmes Implementation

During the review period, the Ministry has achieved the following:

(i). On implementation of various programmes, the Ministry has increased water coverage by 10.1% from 59.9% in 2017 to 70.0% in 2022 while sewerage coverage in urban areas increased by 5% from 26.1% in 2017 to 31% in 2022.

(ii). The Ministry was able to complete 52 projects during the review period with 38 being water projects, 4 sewerage projects and 10 being irrigation projects. During the same period, a total of 5 projects were started with 4 being water projects and 1 being protection works at Upper Tana Natural Resource Management Program.

(iii). Under the Water Infrastructure development, one of the major programmes being undertaken is the Kenya Towns Sustainable Water and Sanitation program targeting rehabilitation and expansion of water and sanitation infrastructure in 28 towns across the country, connecting 2.1 million people to clean water and 1.3 million to sewer systems. The programme is at an average of 65% progress with 8 projects completed. Projects completed in the review period are; Chogoria water supply, Pemba intake Water Supply, Malaba Sewerage and Othaya sewerage project.

(iv). On water harvesting and storage, the Ministry has completed the following dams: Karimenu dam,Thiba Dam and Yamo Dam. The Ministry also fast-tracked construction of large multipurpose dams namely Thwake dam (72%) to supply 150,000 cubic meters of water per day to Makueni County including Konza City, Mwache dam (Survey and Mobilization works) to supply 186,000 cubic meters of water per day to Mombasa, Kilifi and Kwale Counties. The Ministry is also constructing Medium Sized dams such as Siyoi Muruny Dam(65%) to supply 39,000 cubic meters of water per day to Kapenguria in West Pokot County. The Ministry also completed 3 peace dams namely Kases in West Pokot, Forolle in Marsabit and Naku'etum in Turkana.

(v). During the period under review 67 no. small dams and pans were constructed in various counties.

(vi). Under the Big Four Agenda, the Ministry has been undertaking projects to supply water to sites identified by drivers including Special Economic Zones (SEZs) in Naivasha and Mombasa, Level 4, 3 and 2 hospitals across the country, housing projects in Nairobi and Athi River, three livestock holding grounds, two fish markets and three fish landing sites at the Coast. The Naivasha Industrial Park (Naivasha) and Dongo Kundu (Mombasa) water supply projects have been completed. Water connection to the livestock holding grounds, fish markets and fish landing sites at the Coast commenced in the 2021/2022 financial year and are ongoing. Under the Universal Health Coverage (UHC) Programme, 21 facilities have been connected with water out of the target 109.

(vii). The Ministry initiated Water for Schools programme in April 2016 with expected completion in August 2024. As at the end of June 2021 the project completion was 14% with cumulative expenditure of Ksh.330 million. During the FY 2021/2022, the

Ministry was able to connect 65 schools with water surpassing its annual target of connecting 40 schools. This was due to reduced scope of works in some schools leading to savings and thus ability to increase implementation of the programme to more schools.

(viii). Water and Sanitation development (WSDP) project initiated in June 2017 with total project Cost of USD 330 million, is aimed to improve access to water services for approximately 2.02 million people by rehabilitating and expanding urban water supply and sanitation services in the coastal region and marginalized North- eastern Counties of Kenya. In addition, it will improve the financial performance of Water Service Providers affected by Covid -19 Pandemic. The project physical progress is 31%.

(ix). Preparations are ongoing to disseminate the Non-Revenue Water Management Standards in all the 47 Counties to be used by water service providers under the regulation of Water Services Regulatory Board to reduce Non-Revenue Water to acceptable levels of 20% by 2030.

(x). On Irrigation programme, the Ministry developed 112,000 acres under public schemes and community-based smallholder irrigation schemes contributing an average 170,000 tons of rice, 17,000 tons of maize and Ksh. 151 billion in value of horticultural produce for export annually, directly benefiting over 267,426 farmers.

(xi). Under Household Irrigation Water Harvesting project, the Ministry constructed 28,732 household water pans by the end of June 2022 across 31 counties with a combined potential volume of 39.9 million m3 of water to irrigate about 38,904 acres of land and benefitting 28,732 households.

(xii). The Ministry drilled 13 boreholes to supply water to 13 public schools to support the old 4K clubs to begin commercial irrigation of horticultural crops and fruit/tree seedlings production using drip irrigation in greenhouses. In total, 120 public schools have been equipped with 81 boreholes, raised 20,000-liters water tank and 63 greenhouses constructed under the Micro-irrigation programme for schools. The programme also benefits over 35,000 people in communities neighboring the schools.

(xiii). The Ministry targets to carry out land degradation assessments for 15 sub-catchments/ sub-basins. The Ministry has so far conducted 3 river basin-based land degradation assessments for Lake Magadi, Upper Kerio Valley and Upper Ewaso Nyiro North basins. However, the project has been consistently having budget cuts during the years including the financial year under review, leading to delayed implementation of 12 other sub-catchments.

(xiv). Under Water Resources Management, upgrading of 8 River Gauging stations and 45 weather stations to telemetry to enhance data and information collection was implemented. A total of 144 critical catchment areas were identified for gazettement. Management plans for Dik-dik wetlands, Lamu sand-dunes and Kikuyu ground water conservation areas were developed. Also 4 sub catchment management plans were developed and implemented. Groundwater mapping for Wajir, Turkana and Marsabit

County was finalized and ground water potential maps submitted. In addition, ground water mapping of Mandera County, Athi and Tana basin areas covering 17 counties has been initiated.

(xv). Sustainable management of transboundary water resources under joint framework agreements has resulted in development and implementation of joint water projects with riparian states. Currently the Governments of Kenya and Uganda are jointly implementing the Angololo multipurpose dam on Sio Malaba Malakisi river along the border. Also, 5 sub-catchment management plans were developed and implemented. In addition, 5 telemetric stations were installed in Malakisi river basin and Turkana basin.

(xvi). The Water Sector Inter-Governmental Consultation and Co-operation Framework (WSIGCCF) between the Ministry and Chair Environment and Natural Resources at the county governments which is a framework for forging collaboration and cooperation in water and sanitation service delivery through effective cross-sectoral co-ordination was initiated.

(xvii). The Ministry has developed a zero draft of Career Guideline as directed by Public Service Commission to Ministry in the National Government. It was resolved that all Schemes of service be translated to staff career guidelines going forward by respective Scheme administrator. Also, The Ministry has been able to transit officers from Manual performance appraisal system to electronic performance system (GHRIS) platform by carrying out sensitization. Currently 314 officers have been able to set their targets and appraised in GHRIS.

(xviii). On Performance Contracting, aimed at improving efficiency and effectiveness in the management of the Public Service, the Ministry of Water, Sanitation and Irrigation in the FY 2020/21 had a composite score of 3.2454 and ranked No. 6 out of 24 Ministries/Offices/Departments by the Ministry of Public and Gender.

### 2.1.3 Rapid Results Initiative

The Fourth and Fifth wave of 100 days Rapid result initiative (RRI) was undertaken by the Ministry to fast track the completion of the water projects across the sector. The Fourth wave was done between August and November 2021 and involved completion of 20 projects, fast tracked to achieve 100% completion and serving a population of 34,429 households and increased area under irrigation by 6,210 acres and fast tracking legal, institutional and policy reforms.

The fifth wave of 100 days Rapid result initiative (RRI) was conducted between February and May 2022 and resulted in accelerated completion of water and irrigation projects. In the 5th wave 6 irrigation projects and 27 water projects were completed. This saw 10,000 acres of land under irrigation being added and 39,820 households benefitting from the water projects respectively.

### 2.1.4 Development of MTP IV Plan (2023-2027)

Currently, the MTP IV sector plan has been developed and subjected to stakeholders' validation.

## 2.2 Regulatory Frameworks

The Ministry of Water, Sanitation and Irrigation has various Acts, Regulations, Policies and strategies that guide the execution of its mandate. The mandate of the ministry is outlined in the Executive Order No. 1 of 2020, Revised May 2020. The Acts that guide implementation of the mandate of the ministry include: the Water Act 2016, Irrigation Act 2019, Hydrologists Act 2017 and KEWI Act 2001. Other key policy documents of the ministry include: the Constitution of Kenya 2010, the Third Medium Term Plan 2018-2022 (MTP III) of the Kenya Vision 2030, Big Four Agenda, National Water Policy of 2021, Water Services Regulations 2021, Water Services Strategy 2021-2026 ,Water Harvesting and Storage Regulations 2021, Water Harvesting and Storage Strategy 2021-2026, Water resources Regulations 2021, Water resources strategy 2021-2026, National Irrigation Services Strategy 2022-2026 and Irrigation (General) Regulations 2021.

### 2.2.1 Water Act 2016

Water Act 2016 is an Act of Parliament to provide for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes. It came in force on April 2017 when the Cabinet Secretary published notices in the Kenya Gazette, announcing the commencement of the Water Act, No. 43 of 2016.

However, the Water Act 2016 has various gaps which call for its amendment. The draft Water Act 2016 amendment bill is still under review by the Ministry.

### 2.2.2 Irrigation Act 2019

The Irrigation Act 2019 provides for the development, management and regulation of irrigation, to support sustainable food security and socio-economic development in Kenya, and for connected purposes. The Act also provides for establishment of the National Irrigation Authority (NIA) with a national mandate to undertake irrigation development and County Irrigation Development Units (CIDUs) to manage irrigation development at county level.

### 2.2.3 Hydrologists Act 2017

The Hydrologists Registration Board (HRB) is a State Corporation established under the Hydrologists Act No. 19 of 2017. The Board is mandated to regulate hydrologists profession and Practice in the country.

The HRB has developed hydrologists rules and regulations in a consultative process with the stakeholders. The rules and regulations have been submitted to the Attorney General's Office for consideration in parliament and Senate. The board has also developed the Strategic Plan and Human resources instruments and approvals obtained.

### 2.2.4 KEWI Act 2001

The KEWI Act 2001 established the Kenya Water Institute (KEWI) as a Semi-Autonomous Government Agency (SAGA). The institution is charged with the responsibility of capacity building for the water sector and it plays a key role of addressing the human resource needs and provides solutions to challenges facing the sector. KEWI currently has four campuses namely, Nairobi, Kisumu, Kitui and Chiakariga campuses located in Nairobi, Kisumu, Kitui, and Tharaka Nithi Counties, respectively with a total student population of 1,382.

The KEWI Act 2001 is under review for the institution to execute its mandate effectively by aligning it to the Constitution 2010. The draft KEWI bill 2021 is currently undergoing public consultation.

### 2.2.5 RCGW Legal Notice No. 252

The Regional Centre on Groundwater Resources Education, Training and Research (RCGW) is established as a State Corporation under the State Corporations Act vide Legal Notice 252 of 18th December, 2015 and with a broad mandate of initiating and conducting research in mapping and assessment of aquifer systems; and management, conservation, protection and governance of groundwater resources.

## 2.3 Status of Human Resources

Upon the release of Executive Order No. 1 of 2019 in which the State Department of Irrigation was brought back to form the current Ministry of Water, Sanitation and Irrigation, the Ministry undertook a review of the Organization structure and staff establishment. It was submitted to Public Service Commission (PSC) in March 2021 for approval.

On 12th May, 2021, the Ministry received an approved Organization Structure and Staff Establishment from Public Service Commission which revised the current Authorized staff Establishment to 430 and Organization structure that omitted some critical Departments.

The Ministry raised pertinent issues observed and submitted a proposed Organization Structure and Staff Establishment of 696 to the Public Service Commission for consideration and approval.

### 2.3.1 Human Resource at the Ministry Headquarters

The Ministry's current total number of staff is 581 against an authorized establishment of 430 officers, resulting in a variance of 151 staff. Out of the 581 in post, technical departments constitute 51.8 % of staff while shared services is 48.2%. The breakdown is as summarized in Table 1.

Table 1: Current staffing levels per approved departments

| S/No | Department | Authorized establishment | In post | Variance |
|---|---|---|---|---|
| 1. | Office of the Cabinet Secretary | 7 | 7 | 0 |
| 2. | Office of the Chief Administrative Secretary | 4 | 3 | -1 |
| 3. | Office of the Principal Secretary | 7 | 10 | 3 |
| 4. | Water & Sanitation Infrastructure Development & Mngt. | 89 | 88 | -1 |
| 5. | National & Transboundary Water Resources | 126 | 113 | -13 |
| 6. | Irrigation Water Management and Drainage Department | 69 | 53 | -16 |
| 7. | Land Reclamation | 25 | 27 | 2 |
| 8. | Sub -Total | 327 | 301 | -26 |
| 9. | Administration Department | 6 | 12 | 6 |
| 10. | Legal Unit | 2 | 3 | 1 |
| 11. | Public Communication | 7 | 9 | 2 |
| 12. | Clerical Officers | 12 | 14 | 2 |
| 13. | Drivers | 10 | 30 | 20 |
| 14. | Support Staff | 9 | 19 | 10 |
| 15. | Secretarial Services | 13 | 39 | 26 |
| 16. | Human Resource Management and Development | 11 | 18 | 7 |
| 17. | Finance Department | 3 | 5 | 2 |
| 18. | Accounts Department | 6 | 19 | 13 |
| 19. | Supply Chain Management Department | 10 | 17 | 7 |
| 20. | Records Management | 3 | 8 | 5 |
| 21. | Central Planning and Projects Monitoring Department | 5 | 8 | 3 |
| 22. | Information Communication Technology Department | 6 | 7 | 1 |
| 23. | Pension Assistant [3] | 0 | 1 | 1 |
| 24. | Principal Librarian | 0 | 1 | 1 |
| 25. | Supernumerary Posts | 0 | 58 | 58 |
| 26. | Officers to be transferred to Infrastructure | 0 | 12 | 12 |
| 27. | Sub-Total | 103 | 280 | 177 |
| **Grand total** | | **430** | **581** | **151** |

To enhance human resources capacity and development, the Ministry during the review period recruited 72 new staff, 114 officers promoted and trained 40 staff in various institutions for both short term and long courses.

### 2.3.2 Human Resource in the Water Sector Institutions

The total authorized establishment in the Water Sector Institutions is three thousand and fifty-seven (3,157) employees against an in post of two thousand and three (2,003) giving a variance/ gap of one thousand one hundred and fifty-four (1,154) as presented in Table 2.

Table 2: A Summary of Human Resources in Water Sector Institutions

| Water Sector Institution | Required number of staff as per Establishment | In-Post | Variance/ Gap | Remark |
|---|---|---|---|---|
| Water Resources Authority (WRA) | 1,174 | 690 | -484 | The authority has not hired staff due to financial constraints |
| Water Services Regulatory Board (WASREB) | 56 | 30 | -26 | Reviewing staff establishment in line with expanded mandate as provided for in Water Act 2016 |
| Water Sector Trust Fund (WATERFUND) | 175 | 91 | 84 | 78 staff in permanent and pensionable terms of employment while others are in renewable 5-year contracts |
| Kenya Water Institute (KEWI) | 314 | 121 | -193 | The organizational structure and Human Resource instruments have been partially implemented. |
| National Water Harvesting and Storage Authority (NWHSA) | 100 | 196 | 96 | The organizational structure and Human Resource instruments are currently under review |
| Regional Centre on Groundwater Resources, Education and Research | 80 | 9 | -71 | 5 officers are in renewable 3-year contracts |
| National Irrigation Authority (NIA) | 350 | 291 | -59 | |
| Tana Water Works Development Agency (TWWDA) | 105 | 79 | -26 | Currently under review as per the Water Act 2016. |

| Water Sector Institution | Required number of staff as per Establishment | In-Post | Variance/ Gap | Remark |
|---|---|---|---|---|
| Athi Water Works Development Agency (AWWDA) | 99 | 44 | -45 | |
| Northern Water Works Development Agency (NWWDA) | 55 | 38 | -17 | |
| Coast Water Works Development Agency | 173 | 170 | -3 | |
| Lake Victoria South Water Works Development Agency (LVSWWDA) | 151 | 54 | -97 | |
| Lake Victoria North Water Works Development Agency (LVNWWDA) | 76 | 56 | -20 | |
| Tanathi Water Works Development Agency | 105 | 97 | -8 | |
| Central Rift Water Works Development Agency (CRWWDA) | 45 | 36 | -9 | |
| North Rift Water Works Development Agency (NRWWDA) | 99 | 1 | -98 | The Agency recruited a substantive CEO who assumed his duties on 1st May 2022<br><br>The other staff are seconded as follows<br>• 6 No. from LVNWWDA<br>• 7 No from CRVWWDA<br>• 1 No from LVSWWDA<br>• 3 No. from AWWDA<br>• 7 No from MWSI<br>• 3 No. staff on contract<br>The total number of staff at the Agency is 30 |
| **Totals** | **3,157** | **2003** | **-976** | |

### 2.3.3 Achievements in Human Resources

Through implementation of 5th wave RRI (Rapid Result Initiative) on management of pensions cases to achieve acceleration of the service on turn-around time in processing of pension claims the following were achieved:

- 525 pending cases were identified and classified (Death cases, Mandatory retirement cases)

- 314 cases out 525 were processed and submitted to pension for payment
- 49 contact persons to pending Cases reached and requested to submit required documents to finalize their claims

The Ministry Submitted to the Public Service Commission the proposed Organization Structure and Authorized Staff Establishment for approval of 696 and appeal of review of merged departments to be stand alone;

1. Land Reclamations
2. Transboundary Waters
3. Water Storage and Flood Control

The Ministry submitted recommendation on Succession Management of Officers whose scheme of service is administered by the Ministry (MWSI) to Public Service Commission for Consideration and approval.

The Ministry has developed a zero draft of Career Guideline as directed by Public Service Commission to Ministries in the National Government. Going forward, it was resolved that all Schemes of service be translated to staff career guidelines by respective scheme administrators.

The Ministry has been able to transit officers from manual performance appraisal system to electronic performance system (GHRIS) platform by carrying out sensitization. Currently 314 officers have been able to set their targets and appraised in GHRIS.

## 2.4 Post-Covid-19 Response Works

During the period under review, the Ministry rolled out drilling of 50 Boreholes at a cost of 500 million to help in the continued effort to combat COVID-19 in Nairobi and Nakuru. 35 boreholes have been completed.

## 2.5 Sector Financing

The Water, Sanitation and Irrigation Sector budgetary allocation has tremendously increased from Ksh.. 38.2 billion in the financial year 2013/2014 to Ksh.. 70.6 billion in the financial year 2021/22 translating to an overall percentage increase of 84% as shown in Figure 1. During the same period, the expenditures has also increased from Ksh. 26 billion to Ksh. 64.2 billion translating an overall percentage increase of 147%. Further, the budget absorption rates in the same period has increased from 68% to 91%.

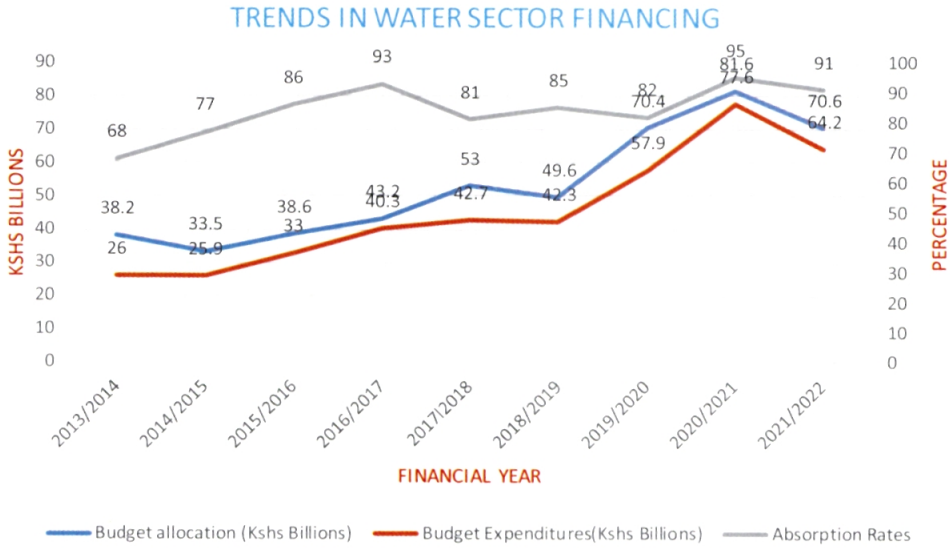



Figure 1: Trends in the Water, Sanitation and Irrigation Sector Financing from 2013/14 to 2021/22 Financial Years

### 2.5.1 Sector Investment Plan

The Ministry in efforts to aggregate the resource mobilization strategies by the national government and County development plans for Water and Sanitation, the Ministry held a stakeholder consultation with all the 47 counties and a total of 2742 projects meant to achieve Universal coverage by 2030 aggregated to form The National Water and Sanitation Investment Program (NAWASIP). The Ministry is to prepare NAWASIP financing plan.

## 2.6 Status of Water Resources

### 2.6.1 Overview of water resources

Water resources play a central role in all the sectors of the economy; including agriculture, energy, industry, tourism, urban and rural development. Its importance is also underscored in the constitution 2010 as it articulates that "Every person has a right to clean and safe water in adequate quantities" and that the state shall use and manage the water resource in a manner that is equitable, efficient, productive and sustainable, and in accordance with the principles of equity, security, equitable access, sustainability, productive management of the resource and sound conservation. Therefore, the need to manage the water resource in a sustainable manner is critical in ensuring its security and availability.

The country's renewable water resource availability per capita has been below 1000 (m3/capita/year) over a long period, currently it is estimated at 450 (m3/capita/year). Despite water scarcity, there are a myriad of challenges facing the water resource which includes; the rising water demand from key economic sectors, catchment degradation, encroachment of riparian land and wetlands, pollution, uncontrolled and unregulated use water resource, climate variability and climate change and limited technical and enforcement capacities.

Different initiatives have been put in place to abide the constitutional obligation to sustainably use and manage the Water Resource. The Development of the National Water Policy of 2021 and Water Resources regulations 2021 which gives effects to obligation of the national government including ensuring protection and conservation of the Water catchments, prevention of pollution, regulation of water abstraction, criteria for prioritization and allocation of the water resource. The basin areas have also been designated as they form the management areas of water resources and Basin Water resources committees were also gazetted.

Further, the Water resources strategy 2020-2025 is also being implemented by the water sector in management of its Water Resource. The implementation of the Strategy is based on the strategic goals which were formulated around thematic areas in line with the national obligations and emerging issues in the water sector; this includes Water resources Monitoring and Assessment, Water protection and conservation, Availability and equitable access to water for all, Water Disaster management, Governance of inter basin and inter county water resources, Water resources regulation, planning and financing and Research innovation and capacity building

The water resources monitoring and assessment has been enhanced through the deliberate process by the Water Resources Authority and the Ministry to rehabilitate and upgrade Water monitoring stations to telemetry. This will improve the data reliability and timeliness. Water resources assessment has also been enhanced through the ground water mapping programme which envisaged to understand groundwater potential. The mapping for Wajir, Marsabit, and southern part of Turkana County were finalized and an initiative to map the Athi and Tana Catchment covering 17 counties was initiated. There has been over reliance on surface water i.e lakes and rivers, therefore understanding of groundwater potential is important for its utilization.

Deliberate efforts have also been employed towards water protection and conservation. The monitoring of Water quality across the country has been ongoing. Joint task force for river restoration was formed, consisting of relevant institutions. The Inter-governmental agencies on River restoration programme is coordinated by the ministry where each institution contributes towards river restoration through its designated mandates. Currently working on the Athi River Basin. Furthermore, catchment management has been enhanced, Water Resources Authority has prioritized four more catchment areas for gazettement and the process is ongoing, while their management plans have been developed.

The formulation of the legal framework; including the Water Act 2016, Water Policy 2021, Water Resources strategy (2020-2025) and the Water resources guidelines in tandem with

provisions of the constitution 2010, has strengthened the management of Water Resources. However, there is also a need to deliberately strengthen water resources financing and enhance technical and enforcement capacities. This will enhance the implementation of the themed strategic objectives in Water Resources Strategy and also minimize on some of the enumerated challenges facing Water Resources.

### 2.6.2 Water Resources Management

Water Resources Management is carried out at River basin level. The Water Act, 2016 provides for the designation and gazettement of the Basin areas by the Cabinet Secretary in consultation with the Water Resource Authority. There are six designated basin areas, managed by the Basin Water Resources Committees. The designated basin areas are as follows:

#### 2.6.2.1 Lake Victoria Basin

Lake Victoria is the largest Lake in Africa, and due to its expansive nature, it has a very large Catchment Area. The Catchment is shared between five countries (Kenya, Uganda, Tanzania, Rwanda and Burundi) while the Riparian is shared between three countries (Kenya, Uganda and Tanzania). Kenya's section of the catchment area covers about 42,460 km2 covering about 15 counties with different physical characteristics. Due to the complex nature of the Basin, WRA divided it into two:

*i. Lake Victoria North Basin Area*

This covers 8 counties (Trans Nzoia, Kakamega, Bungoma, Siaya, Vihiga, Nandi, Uasin Gishu and Busia). WRA headquarters for this area is located in Kakamega.The major rivers within the Basin are the Nzoia River, which drains 70% of the catchment and the Yala River which drains about 18% of the catchment. Both rivers flow into the L. Victoria.The Sio River, a transboundary river, falls within the Basin. This Basin is divided into 40 sub-basins.

*ii. Lake Victoria South Basin Area*

This covers 7 counties (Kisii, Kisumu, Kericho, Nyamira, Migori, Homa Bay and Bomet). WRA headquarters for this area is located in Kisumu. The Basin is characterized by the Nandi escarpment and the Mau Forest Complex on its north-eastern border from where its major rivers originate.The major rivers within the Basin include the Nyando, Sondu, Mara and Gucha rivers. The four rivers drain into L. Victoria. The Mara River crosses the border into Tanzania. Smaller catchments drain the Basin into L. Victoria, discharging into the Winum Gulf.The main wetlands within this Basin are associated with the Migori, Nyando and Sondu Miriu Rivers.This Basin is divided into 29 sub-basins.

#### 2.6.2.2 Rift Valley Basin Area

This covers 7 counties (Nakuru, Turkana, West Pokot, Baringo, Elgeyo Marakwet, Narok and Nyandarua). WRA headquarters for this area is located in Nakuru.The Basin covers most of the former Rift Valley Province, bordering all the other Basins on the East and West. The Central parts of the Basin are covered by the water towers of the Cherangany Hills, Mau Forest Complex and the Aberdare Ranges. It is characterized by the seven major lakes and their respective drainages as follows;

- Lake Turkana (a transboundary lake) and its entire drainage, including the Omo River catchment in Ethiopia and the Kerio and Turkwel Rivers catchment in Kenya;
- Lake Magadi in the south of the Basin Area, mainly fed by underground rivers;
- Lake Baringo which is fed by the Perkerra, Molo and Mukutan rivers;
- Lake Naivasha, fed by the Malewa and Gilgil rivers.
- Lake Bogoria, fed by Waseges (or Sandai) river originating from the slopes of the Nyandarua Plateau, just below the Aberdare Ranges;
- Lake Nakuru and Lake Elementaita.

In addition to the above lakes, three more river basins are located within the Basin. These are the Tarish River (feeding the Lotiki Swamp), the Suguta River and the Ewaso Ng'iro South River originating from the Mau Escarpment.This Basin is divided into 33 sub-basins.

#### 2.6.2.3 Athi River Basin Area

This covers 9 counties (Kiambu, Nairobi, Kajiado, Machakos, Makueni, Kilifi, Taita Taveta, Kwale and Mombasa). WRA headquarters for this is located in Machakos.The major river within the Basin is the Athi River which drains to the Indian Ocean. It is the second-longest river in the Country.Two other transboundary rivers are found within the catchment. The Lumi River originates along the Eastern Slopes of the Kilimanjaro and flows across the border into Tanzania and the Umba River flows from Tanzania into the Basin south of Mombasa. Major wetlands within the Basin include the Ondiri Swamp, Ol Ngarua Swamp, Ol Keju Ado, Ndumato, Jipe, Mangeri Swamp and the Mangroves along the Coast. A few inland freshwater lakes are found within the Basin, Jipe, Chala and Amboseli. This Basin is divided into 32 sub-basins.

*a. Tana River Basin Area*

This covers 10 counties (Kirinyaga, Nyeri, Embu, Murang'a, Tharaka Nithi, Garissa, Kitui, Tana River, Meru and Lamu). WRA headquarters for this is located in Embu. The major river within the Basin is the Tana River which drains to the Indian Ocean at the Tana Delta. It is the longest river in the country, originating from the slopes of Mt. Kenya.The upstream tributaries include the Chania, Thiba, Maragua and Thika rivers. This Basin is divided into 39 sub-basins.

*b. Ewaso Ng'iro Basin Area*

This covers 6 counties (Laikipia, Samburu, Isiolo, Mandera, Marsabit and Wajir). WRA headquarters for this is located in Nanyuki, Laikipia County.The Ewaso Ng'iro River is the largest in the Basin. It discharges into the Lorian Swamp.The upstream tributaries include the Ewaso Narok, Nanyuki, Isiolo, Osinyai and Milgis rivers. Several transboundary rivers flow within the Basin, of note Kore and Bolo rivers flowing from Ethiopia; the Dawa River which forms a part of the Kenya-Ethiopia Border.Other wetlands include Ewaso Narok and Suguta Marmar swamps.This Basin is divided into 26 sub-basins.

### 2.6.3 Water Resources Availability

According to the National Water Master Plan 2030, the renewable water resources is estimated at 42.1 BCM/year, which consists of 20.6 BCM/year of surface water and 21.5 BCM/year of groundwater recharge, assuming that the sustainable groundwater yield is 10% of the groundwater recharge, the available water resources was estimated at 22.5 BCM/year as indicated in Table 3. The available per capita water resource was estimated at 586m3/y/capita in 2013. The Available per capita is dwindling towards the projected years of 2030 and 2050. Table 3 below gives the projected water resources available and renewable for the years 2010, 2030 and 2050. The increase in available water resources in the six basins is attributed to the projected increased rainfall due to impacts of climate change.

Table 3: Renewable and Available Water Resources

| Item | 2010 | 2030 | 2050 |
|---|---|---|---|
| Precipitation (P) *(BCM/y) | 400.1 | 441.6 | 471.9 |
| Evapotranspiration (E) **(BCM/y) | 358.0 | 397.3 | 425.9 |
| Renewable WR (P-E) (BCM/y) | 42.1 | 44.3 | 46.0 |
| Renewable SW (BCM/y) | 20.6 | 24.9 | 26.7 |
| GW Recharge (BCM/y) | 21.5 | 19.4 | 19.3 |
| Sustainable Yield of GW*** (BCM/y) | 1.9 | 1.7 | 1.7 |
| Available Water Resources (BCM/y) | 22.5 | 26.6 | 28.4 |
| Population Projected (million) | 38.5 | 67.8 | 96.9 |
| Per Capita RWR ($m^3$/y/capita) | 1,093 | 653 | 475 |
| Per Capita Available WR ($m^3$/y/capita) | 586 | 393 | 293 |

*Source: National Water Master Plan (NWMP 2030)*

### 2.6.3.1 Groundwater Potential and Exploitation

In the Financial year 2021/2022, the country continues to experience drought and the hardest hit counties include the Northern and North Eastern areas of the country. In the year under review a new intervention has been in the offing aimed at increasing the resilience of communities and ecosystems in Turkana. Marsabit, Wajir, Mandera and Garissa Counties. Towards this end the Ministry will be implementing information acquisition and groundwater conservation projects in the counties mentioned above.

The statistics derived from National Water Master Plan 2030, put the total groundwater potential of the country at 1,740 MCM/year. The Nairobi aquifer suite continues to be exploited heavily as it is the only reliable source of water. High density of boreholes is found in the areas of Karen, Langata, Embakasi and City Centre, Kiambu and Kajiado, Kitengela, Ongata Rongai and Ngong. It is worth noting that, there are additional boreholes (approximated to be more than 2,500) drilled without authorization from WRA, including those by County Governments.

The Nairobi aquifer suite (NAS) alone that straddles across several counties has over 7,000 boreholes. The counties include Nairobi City, Kajiado County, Kiambu County, Murang'a County and Machakos Counties and is classified as a strategic aquifer under the WRA Aquifer classification. It is significant as it augments the balance of the public water demand in its extent. In some parts of the Nairobi metropolitan, it is the only source of water. Table 4 shows estimates the groundwater use in each of the basins and the balance thereof.

Table 4: Summary of Groundwater Use Balance by Basin

| Basin | Basin Area | Groundwater Potential | Estimated Use | Groundwater Use Balance | Area of over abstraction |
|---|---|---|---|---|---|
| | km2 | MCM/year | MCM/year | MCM/year | km2 |
| Lake Victoria North | 18,500 | 216 | 13.3 | 202.7 | 7 |
| Lake Victoria South | 26,906 | 292 | 13.3 | 278.7 | 15 |
| Rift Valley | 131,423 | 400 | 35.1 | 364.9 | 2,515 |
| Athi | 66,559 | 559 | 84.6 | 474.4 | 3,147 |
| Tana | 126,208 | 693 | 18.2 | 674.8 | 484 |
| Ewaso Ng'iro North | 209,918 | 449 | 18.2 | 430.8 | 821 |
| **Total** | **579,514** | **2,608** | **182.7** | **2,426.3** | **6,989** |

*Source: National Groundwater Balance Report, June 2021 WRA*

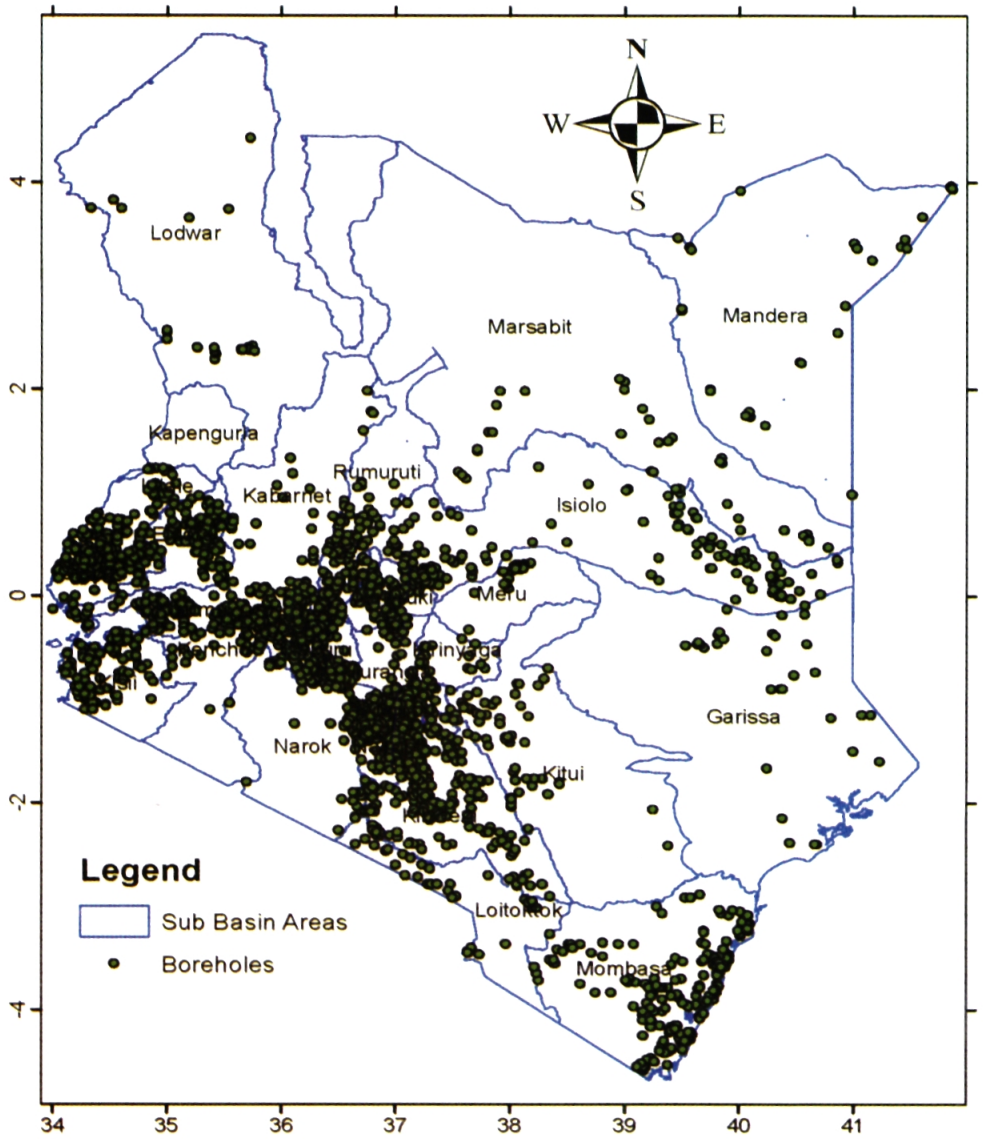



Figure 2: Map of boreholes spatial distribution and sub basin delineations across the country

Areas with high borehole density has negative water balance due to over abstraction. Coastal areas along the shoreline, a small section of upper Athi, small section of upper Tana and areas around Lake Victoria Catchment still have positive water balance due to less abstraction as shown in figure 5. Areas with negative balance require managed aquifer.

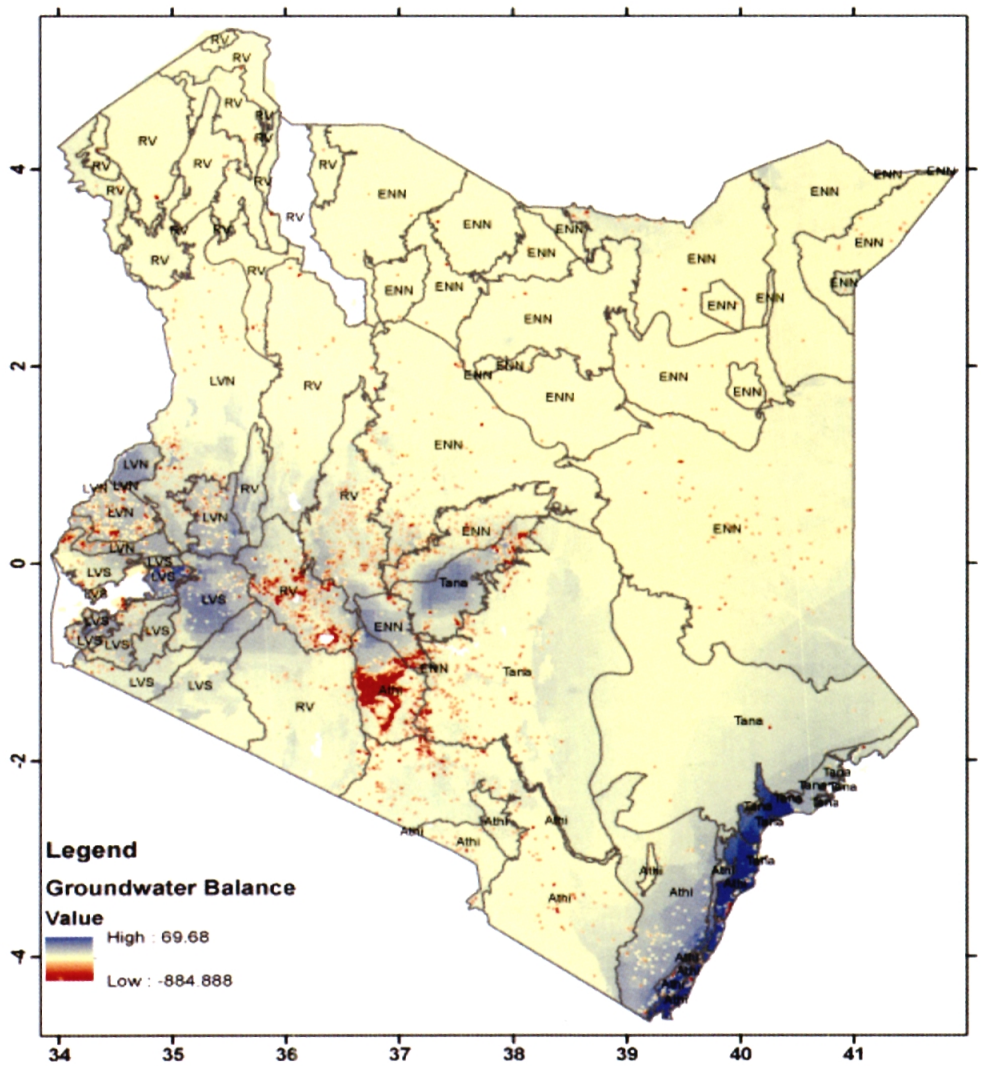



Figure 3: Groundwater balance map of Kenya with an overlay of aquifer boundaries

Groundwater applications have increased since WRA began its operations. While new applications and authorizations have increased uniformly over time, a lack of authorization conversion is clearly visible, revealing that WRA abstractions are clearly below the actual abstraction. WRA received 855 new applications in the last financial year, issued 4,232 drilling authorizations, and granted 1,137 permits. This shown in figure 6 below;




Figure 4: Groundwater applications and approvals from the year 2004 – 2022

### 2.6.3.2 Ground Water Mapping and Assessment

In recognizing the potential of mobilizing new innovations in groundwater exploration technologies to help bridge the groundwater knowledge gap and tackle water scarcity and unlock the potential of the resource to promote socio-economic developments, the Ministry of Water Sanitation and Irrigation, Water Resources Authority and United States Geological Survey (USGS) undertook a groundwater exploration and assessment program in the southern parts of Turkana County, Wajir County and the whole of Marsabit County. The program was supported by the United States Agency for International Development (USAID). The Mapping for Wajir, Turkana and Marsabit Counties has been completed and the groundwater potential maps submitted to the Ministry. The Ministry has further initiated the process of Mapping groundwater potential in Mandera County, Athi and Tana basin which constitute 17 counties.

### 2.6.4 Water Use

The Water Resources Authority is mandated through the Water Act 2016 as a lead Agency to regulate the management and use of the water resources as both surface and groundwater with regard to quality and quantity. All water uses are regulated through the established Permitting System to ensure sustainable use of water resources in view of growing water

needs and demands. In exercising its mandate, the Authority greatly adopts the Integrated Water Resources management (IWRM) principles. The Authority employs equity and prioritizes the apportionment and allocation of the water resources. Similarly, the Authority protects and conserves the limited freshwater resources from pollution through the Waste Disposal Control Plans that include Effluent Discharge Control Plans (EDCPs). The Water Resources Authority undertakes enforcement on EDCPs.

Towards sustainable utilization of groundwater resources water allocation plan for Nairobi Aquifer Suite has been reviewed and also the water allocation plan for Lamu Island has been developed. Concerted efforts have also been employed in determination of the abstraction boreholes through development and population of the WRA borehole database across the country. A new groundwater information system is being proposed to be rolled out.

The Authority has endeavored to develop waste management and water use efficiency guidelines for better utility of the groundwater resources in the Kikuyu Springs groundwater conservation areas

#### 2.6.4.1 Groundwater Monitoring

The Ministry through Water Resources Authority has been undertaking groundwater resources monitoring since its establishment in 2005. This has mainly been an ad hoc arrangement with owners of production wells. Towards this end WRA has continued to get data from these boreholes and currently number 157 across the country. However, it is crucial that a dedicated groundwater monitoring network is set up to enable monitoring of groundwater levels and quality. In 2021/2022 the Authority has continued to maintain the existing telemetric network which are giving data to inform groundwater levels under the Nairobi aquifer suite Tiwi aquifer and the Lamu sand dunes aquifer.5 data loggers were installed in Kisumu, Kabatini and Bungoma monitoring boreholes. These monitoring wells are already giving groundwater level data received in the water resources information system of WRA. A proposal is under the Horn of Africa – Groundwater for resilience project to install further monitoring wells in the seven aquifers; Walda Rawana, Lotikipi, Napuu, Daua, Merti, Logologo Shuur and Neogene aquifers. This will lead to better groundwater management towards goals of ensuring sustainable access and management of groundwater.

Groundwater levels and Recharge in the Nairobi aquifer suite are shown in the monitoring wells data. The groundwater levels in the Kikuyu monitoring well demonstrate that shallow aquifers generally rise when there is higher rainfall. This is also seen from the deeper aquifers which have higher groundwater levels when there is higher rainfall amounts.

It is also observed that there is a general decline of groundwater levels. This may be attributed to high abstractions that are not commensurate with the recharge (low rainfalls within the year were recorded)

### 2.6.5 Water Resources Monitoring

#### 2.6.5.1 Surface Water Monitoring

The attainment of the government's target of ensuring improved availability and access to water by all requires a robust and comprehensive assessment and monitoring system which accurately tracks quantity and quality of water resources for effective management.

Monitoring networks in the country comprises meteorological stations and hydromet stations. The distribution of hydro meteorological and weather monitoring stations for the country are shown in Figure 5.

There are a total of 223 rationalized surface water monitoring stations categorized as National, Management Unit, Intra Management unit and Special Stations. The stations have been geo-referenced and uploaded in the National Monitoring and Georeferenced Information System. The number of stations and operational status are as shown in Table 5.

Table 5: Surface Water Monitoring Stations and Operational Status

| Region | Category | | | | Total | % Operational |
|---|---|---|---|---|---|---|
| | National | Management Unit | Intra Management Unit | Special | | |
| LVNCA | 5 | 8 | 9 | 6 | 28 | 82.6 |
| LVSCA | 5 | 14 | 20 | 1 | 40 | 75 |
| RVCA | 7 | 13 | 20 | 0 | 40 | 82.5 |
| ACA | 3 | 4 | 22 | 3 | 32 | 75 |
| TCA | 1 | 7 | 21 | 16 | 45 | 80 |
| ENNCA | 1 | 4 | 31 | 2 | 38 | 81.5 |
| **Total** | **22** | **48** | **122** | **31** | **223** | |

*Source: WRA Water Situation Report 2020-2021*

#### 2.6.5.2 Rehabilitation of the Surface Water Monitoring Station

Surface Water stations are periodically rehabilitated and upgraded to telemetry to improve on data collection and decision making. The upgrading of stations to automatic logging and telemetric transmission has ensured that accurate and timely data is captured. The automatic stations are configured to record data on hourly basis and transmit to a server which can be accessed via web-based portal.

In the financial year (2021-2022), the Water Resources Authority rehabilitated 4No. surface water monitoring stations and the Ministry 4No. to telemetric stations under the IGAD HYCOS project, totaling to 8 telemetry stations. The upgraded stations by WRA to telemetric stations were the ones whose sensors had been washed away by floods. The work done included reinstallation of water level sensors, configuration, calibration and reactivation of the loggers and modems to transmit data to the WRA server. The 8rehabilitated stations were as follows:

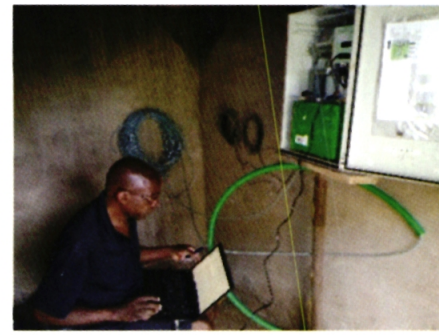
1. 1AA01 Malaba River in Lake Victoria North Basin area
2. 2B33 Suam River and 2B21 Turkwel River in Rift Valley basin area
3. 4BB01 Ragati River in Tana basin area
4. 5ED01 EwasoNgiro in EwasoNg'iro North basin area
5. 2EC02 Rongai in Rift Valley Catchment
6. 5DA08 Isiolo in Ewaso Ng'iro North Basin area
7. Kirichwa Kubwa in Athi Catchment



*Re installation of the water level sensor at RGS 2B21 Turkwel river*



*Malaba RGS 1AA01 after installation*



*Reconfiguration, Calibration and reactivation of the sensor at RGS 2B33 Suam river*

### 2.6.5.3 Weather Monitoring Stations.

Water Resources Authority operates a weather monitoring network comprising rainfall, evaporation and climate stations. A total of 156 rainfall stations, 47 evaporation and 17 climate stations were operational as at the end of quarter 3. The regional breakdown is given in the Table 6.

Table 6: Weather monitoring network

| | Rainfall | No. Operational | Evaporation | No. Operational | Climate | No. Operational |
|---|---|---|---|---|---|---|
| ACA | 45 | 25 | 7 | 3 | 5 | 2 |
| ENNCA | 26 | 6 | 4 | 2 | 9 | 2 |
| LVNCA | 72 | 30 | 10 | 3 | 5 | 0 |
| LVSCA | 47 | 36 | 20 | 18 | 12 | 10 |
| RVCA | 23 | 21 | 7 | 6 | 3 | 3 |
| TCA | 53 | 38 | 17 | 15 | 2 | 0 |
| **Total** | **266** | **156** | **65** | **47** | **36** | **17** |

The weather monitoring stations operated by WRA are strategically located at various parts in the catchments. Data is also obtained from various stakeholders such as private institutions, government and learning institutions. The data collected from these stations is used for modeling and planning purposes. Figure 6 shows the distribution of weather monitoring stations.




Figure 5: Rainfall monitoring network

### 2.6.5.4 Rehabilitation of New Weather Stations

During the period under review, 45 weather stations were configured to transmit data to the WRA server. The stations were upgraded to telemetry through the Kenya Water Security and Climate Resilience Project and had been configured to only transmit data to Kenya Meteorological Department server. The proposed configuration enabled data to be transmitted to WRA sever as backup.

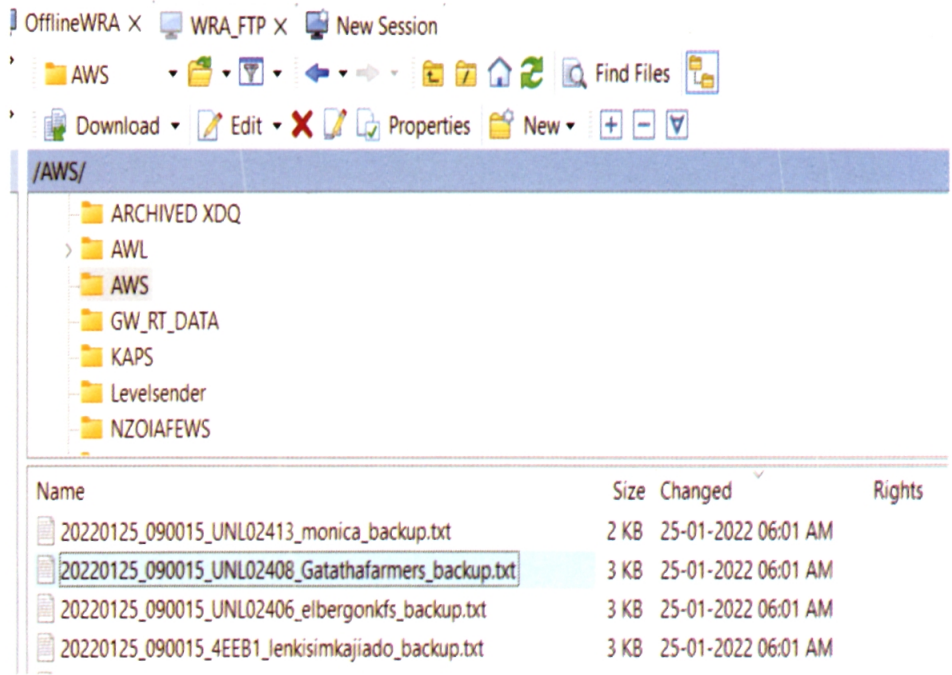



Figure 6: Screenshot of WRA FTP server with weather station telemetry data

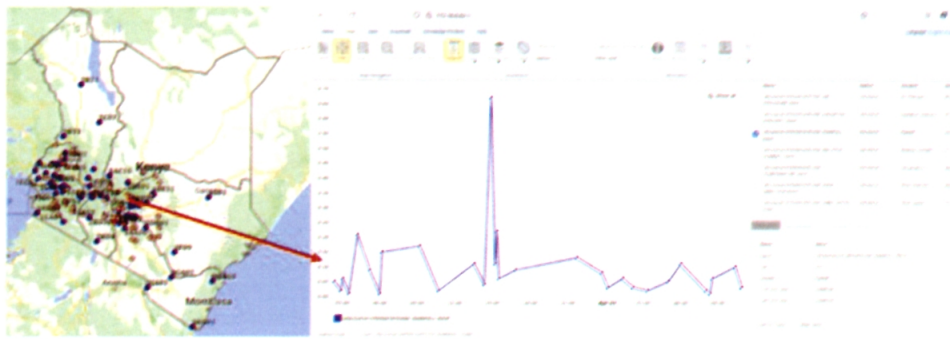


Figure 7: Display of Telemetric Stations on WRA Web Portal and Sagana State Lodge Weather Station data

#### 2.6.5.5 Water quality and Pollution Control

The right to a clean and healthy environment is articulated in the CoK,2010. The Ministry has an obligation to protect and conserve the water resource. However, water resources continue to be threatened by pollution. Due to the increased threat of pollution to the water resources, the Water Resources Authority monitors water quality and pollution control, across all the six (6) basin areas. The water quality and pollution monitoring stations comprise of surface, Ground and effluents as shown in Table 7.

Table 7: National Water Quality Monitoring Stations

| Station Type Basin Area | SW | GW | Effluent | Total | 1ST Priority Stations |
|---|---|---|---|---|---|
| LVNCA | 44 | 19 | 39 | 102 | 24 |
| LVSCA | 77 | 29 | 26 | 132 | 54 |
| RVCA | 49 | 30 | 23 | 102 | 27 |
| ACA | 55 | 45 | 32 | 132 | 44 |
| TCA | 58 | 19 | 27 | 104 | 30 |
| ENNCA | 46 | 19 | 21 | 86 | 23 |
| **Grand Total** | **329** | **161** | **168** | **658** | **202** |

*Source: WRA Water Situation Report 2018-2019*

356 water quality and pollution dataset were generated from the monitoring Programme of WRA in addition to the customers' samples when submitted to the WRA laboratories for the analyses.

During the financial year under review, the following activities were carried out as part of conserving and protecting the water resources from pollution;

- Affirmed the reviewed water quality and pollution monitoring network and held water quality and pollution data collection modalities with the Basin and Sub-Basin stations water quality and pollution control officers;
- Mapped and georeferenced 433 out of a total of 658 rationalized water quality and pollution control monitoring stations;
- Quarterly water quality monitoring of the upstream ecosystems of Athi river feeding into Thwake dam within the Athi river Basin.

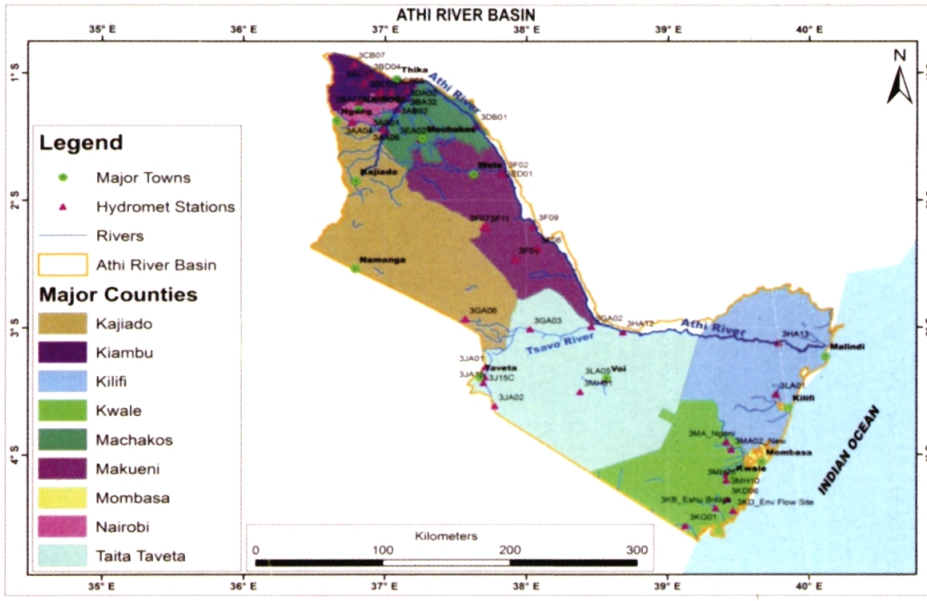



Figure 8 : The map of Athi river Basin showing Athi and Thwake rivers amongst other attributes



Figure 9: Myriad and uncontrolled wastewater channels in the Mlololongo Highrise residential buildings.



Figure 10: Water quality and pollution monitoring upstream of Athi/Thwake rivers confluence

- Marked, pegged and mapped over 92 kilometers of the riparian reserves in the priority areas in the upstream ecosystems of Thwake dam. The riparian reserves provide aquatic ecological functions and act as buffer zone that filters the non-point sources of pollution to the susceptible surface water resources.
- Quarterly water quality monitoring of the Karimenu II Dam. 18No. points are monitored during quarterly monitoring exercise.

- 4No. water abstraction and pollution surveys were conducted in the following sub catchment: - Nairobi River Basin (major rivers comprising Ngong, Mbagathi, Nairobi, Kirichwa and Mathare), Moiben river system that serves Eldoret town, Mwania Mbogo and Muringato river systems. Surveillance, enforcement for compliance is ongoing in these areas where surveys have been conducted.
- Assessment was conducted to determine Arsenic prevalence in groundwater and advise accordingly in Garissa County. A general observation from 24No. the assessed borehole is that the water quality deteriorated in boreholes away from river Tana. An enhanced and repetitive detailed monitoring during the wet and dry weather seasons is recommended to ascertain the extent of this prevalence since groundwater is the main source of water in the county.

### 2.6.6 Catchment Protection and Conservation

Significant strides have been made in regards to declaration and protection of catchment areas. A total of 144 critical catchment areas and wetlands were identified countrywide that require gazettement. Management plans have also been developed in respect to the Dik-Dik Wetland, Lamu Sand Dunes and the Kikuyu Groundwater Conservation areas. Catchment protection processes have also been initiated for Ngalaren in Loitoktok, Gathwariga in Nyeri and Kajulu Hills in Kisumu.

The process of protection and conservation of groundwater resources has been undertaken for the Lamu sand dunes Groundwater Conservation areas and the Kikuyu Springs Conservation areas has been initiated and well advanced. The request for gazettement was done through the Ministry and documentation submitted to the Attorney General.

Other areas that have been identified and initial processes undertaken include the Lake Kenyatta Groundwater Conservation area/Catchment area and Kajulu Groundwater Conservation area/Catchment area. In addition to this, a draft policy for the protection of groundwater has been developed.

### 2.6.7 Water Resources Management intervention measures

The Ministry has an obligation to Manage the Water Resource. This far, the Ministry has put in place policies, strategies and Regulations to improve the management of Water resources. The Ministry developed the Water Resources Strategy 2020-2025 and Water Resources Regulations, 2021. The strategy provides the government's plan and programmes for the regulation, monitoring, protection, conservation and management of the Water Resource for the five year period. The Water Resources Authority is implementing the strategy. Water resources management intervention measures undertaken to improve water availability and reduce adverse effects on water resources include the following among others: Catchment areas restoration; riparian zone protection and conservation; control of soil erosion; construction of sand dams and earth dams; protection of wetlands and springs

;water harvesting and safe storage; Groundwater exploration; Installation and rehabilitation of water resources monitoring networks; Development and implementation of catchment management plans and strategies; Development and implementation of Water Allocation Plans; Pollution monitoring and control; Community sensitization programmes on water resources management; Exploring the innovative solutions for waste management through promotion

### 2.6.8 Transboundary Water Resources

Transboundary water resources are water resources that are shared between two or more countries. Kenya shares about 54% of its surface and groundwater resources with neighbouring countries. These countries are the Republic of Uganda, United Republic of Tanzania, Republic of South Sudan, Republic of Ethiopia and Republic of Somalia as shown in figure 11. These shared water resources need to be sustainably managed and developed in an equitable manner. In order to achieve sustainable management and equitable development of the shared water resources, the Government of Kenya with riparian states have been developing framework agreements such as Memorandum of Understandings (MoUs) and cooperative framework agreements among others. The shared water resources between Kenya and other neighbouring countries are as follows:

#### 2.6.8.1 Lake Victoria Basin

The Lake Victoria Basin is shared by Kenya, United Republic of Tanzania and Republic of Uganda. In Kenya Lake Victoria is drained by nine main river basins. These river basins are Sondu-Miriu, Mara, Nyando, Yala, Nzoia, Sio, Malakisi, Lwakhakha and Malaba. Mara River basin is shared by Kenya at the upstream with United Republic of Tanzania at the downstream. Also, Lwakhakha, Sio, Malaba and Malakisi rivers are shared between Kenya and Uganda at the border. The surface water resources in the lake basin have been affected by increasing water demand and adverse climatic conditions such as prolonged droughts. Despite the fact that water abstractions and evaporation rates in the lake basin has been improving, water availability was projected to be increasing by approximately 1.25% annually (NWMP, 2030). In the year 2019 -2020 rainfall being recorded in the lake basin since April, 2019 to April, 2020 was high compared to previous years. The water quality in the lake has been affected by inflow of sediment and nutrients influx from the catchment areas due to extensive agricultural activities in the lake basin. Hence joint efforts between the ministry and stakeholders have developed different programmes to reduce inflow of nutrients, waste water and solid wastes into the lake. These include tracing of point and non-point source of water pollution, relocation of solid waste dumping sites, tree planting at the degraded areas in the catchments, gabion construction to reduce transfer of sediments into the water bodies and installation 10 telemetric hydromet stations to measure water levels and flows.

#### 2.6.8.2 Ewaso Ngiro South River Basin

The Ewaso Ngiro South River originates from Kenyan side in Narok County and flows across the border to Lake Natron in the United Republic of Tanzania at the downstream. The Ewaso Ng'iro South River is a key source of water to residents of Narok and Kajiado Counties. Water availability in the river basin has been enhanced by use of groundwater and rainwater harvesting using water pans and storage tanks.

#### 2.6.8.3 Lake Challa Basin

Lake Challa is a crater lake that straddles the border between the Republic of Kenya and United Republic of Tanzania. The lake is east of Mount Kilimanjaro, 8 kilometres (5.0 mi) north of Taveta, Kenya, and 55 kilometres (34 mi) east of Moshi, Tanzania. The lake is surrounded by a steep crater rim with a maximum height of 170 metres (560 ft).Approximately 80 percent of the lake's inflow comes from groundwater, which is derived mostly from rainfall in the montane forest zone of Mount Kilimanjaro at an elevation of 1,800 to 2,800 metres (5,900 to 9,200 ft). The fresh water lake lacks the outlet to discharge inflow water hence the lake levels has been increasing by about 0.5 m annually. Through a signed MOU between the two countries, a water allocation plan for the Lake Challa was developed to enable equitable utilization of the fresh water in Lake Challa. The implementation of the signed MoU is ongoing by the joint working groups.

#### 2.6.8.4 Lake Jipe and Lumi River Basin

Lake Jipe starts at the slopes of Mt. Kilimanjaro bordering the Republic of Kenya and the United Republic of Tanzania. The lake is fed mainly by the Lumi River, which descends from Mount Kilimanjaro and traverse Taita-Taveta County, as well as streams from the North Pare Mountains, being on the leeward side. The lake's outlet forms the Ruvu River. Tsavo West National Park protects and Mkomazi Game Reserve surrounds the Lake Jipe protecting from encroachment by the communities. Rainfall received in Lumi River Basin is high during wet season causing flash floods at the downstream. The Lumi River being the only source of surface water in Loitoktok - Taveta experience low flows during dry periods due to over abstraction and lack of rainfall to refill the water channel. Hence this seasonal variability has resulted in water shortage. In order to curb water shortage, the ministry has initiated groundwater mapping in entire Mt. Kilimanjaro region Kenyan side to provide alternative water source for various water demands.

#### 2.6.8.5 Lake Turkana and its river basin

The Lake Turkana, formerly known as Lake Rudolf, is a lake in the Kenyan Rift Valley, in northern Kenya, with its far northern end crossing into Ethiopia. The lake is fed by River Omo from Ethiopia and Turkwel and Kerio rivers from Kenya. The lake level in Turkana has been receding since 1975. For example, the lake level fell by 10 m (33 ft) between 1975

and 1993. The construction of 250 m high Gilgel Gibe III Dam on Omo River in Ethiopia will increase the falls in lake water levels. In 2018-2019 it was realized that the lake levels had receded by about 2 m. Also, agricultural activities taking place in the catchments of the lake has increased inflow of sediments into the lake reducing the water quality. Despite the fact that the lake waters are saline, communities living around the lake relies on spring and boreholes water for domestic purposes. The rains received in 2019-2020 increased the lake levels in Rift Valley lakes including Lake Turkana. Identification of degraded hotspots areas in the Lake Basin in Kenyan side was done in 2020 and catchment rehabilitation measures will be conducted in the basin to reduce soil erosion. To regulate water abstraction in the catchment areas and at the lake 30 telemetric hydrometric stations was installed in 2019-2020 to monitor river and lake levels from upstream to downstream.

#### 2.6.8.6 Daua and Laghs Dera River Basin

Dauaand LaghDera River basin is shared by Kenya, Ethiopia and Somalia. The rivers which drain the Dauaand LaghDeraRiver Basin in Kenyan side are Daua River flowing through borders of Kenya and Ethiopia in Mandera County, River Kutulo that emanates from Mandera County during wet season, Lak Bor and LaghBogal originating from Marsabit County and flows through Wajir County, EwasoNg'iro North and Milgis flowing from Mt. Kenya and hills of Marsabit County at the upstream and flows through Wajir to Somalia. The river basin in Kenya is characterized by aridity and hence the rivers become seasonal during dry spells. This creates water and food shortage in the northern region and leaving the residents to rely on groundwater.

#### 2.6.8.7 The Rift Valley Groundwater Aquifers

There are seven shared aquifers between Kenya and its neighbouring countries. At the northern part of the Kenya, North Rift Valley aquifer that starts from Menengai Crater in Nakuru and extends towards southern parts of Ethiopia. At the southern part of Kenya, South Rift Valley aquifers starts from Kenyan Rift valley extending towards Lake Eyasi in United Republic of Tanzania.

#### 2.6.8.8 Mt. Kilimanjaro-Chyulu Hills Aquifer

Mt. Kilimanjaro-Chyulu Hills aquifer is shared between Kenya and the United Republic of Tanzania. The aquifer is rich in groundwater due to continuous recharge of the aquifer by heavy rainfalls experienced in the Mt. Kilimanjaro and its slopes. The Mzima springs supplying Taita-Taveta and Mombasa Counties.

### 2.6.8.9 Kenyan Coastal Aquifers

The sand aquifer in Lamu-Kiunga is shared between Kenya and Somalia at the north coastal areas of Indian Ocean. Tiwi aquifer located in south coast of Kenya is shared by Kenya and United Republic of Tanzania. The coastal aquifer is potential sources of water to meet demands of north and south coast communities.

### 2.6.8.10 Merti -Daua aquifers

The Merti Aquifer is located in northeast Kenya and provides water to the local population as well as a growing number of refugees in the area. Although it is the most important source of fresh water in the region, relatively little is known about the extent of the aquifer, its hydrogeological parameters and groundwater recharge. The aquifer extends from Kenyan part to Somalia. The Daua aquifer is located in Mandera County and southern parts of Ethiopia. The Merti-Daua groundwater is the main source of water to the northern inhabitants. Therefore, exploitation of the groundwater in the northern aquifers should be well controlled to avoid over abstraction and conflicts among water users.

### 2.6.8.11 Sudd aquifer

The Sudd aquifer is located in north western part of Turkana County. The aquifer is shared between Kenya, South Sudan and Ethiopia. The Sudd aquifer is a potential water resource to meet water demands in Turkana County.

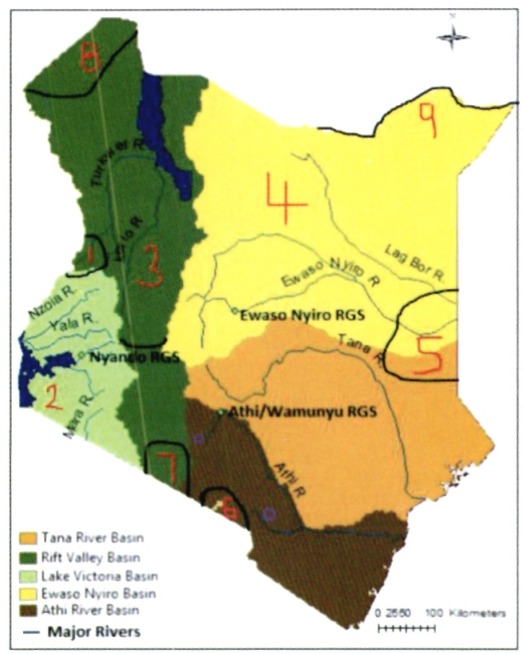



Figure 11: Transboundary water resources in Kenya

KEY

1. Sio-Malaba-Malakisi, Lwakhakha and Suam rivers and Mt. Elgon aquifer - shared with Uganda
2. Lake Victoria Basin - shared with Tanzania and Uganda
3. Lake Turkana and its river basins - is shared with Ethiopia
4. Lag Dera and Lag Bor - shared with Somalia
5. Merti Aquifer - shared with Somalia
6. Lakes Challa and Jipe - shared with Tanzania
7. EwasoNgiro South River and Lake Natron- shared with Tanzania
8. Sudd Aquifer – Shared with South Sudan and Ethiopia
9. River Daua surface and groundwater- shared with Ethiopia and Somalia

### 2.6.9 Water Resources Management Projects/Programmes

The following water resources management projects and programmes are being implemented to ensure sustainability of safe and reliable water resources in the country.

i. Kenya groundwater mapping programme

The aim of the programme is to identify areas of high groundwater potential in order to enhance the effectiveness of managing the resource for development. This entails the mapping of the ground and surface water and its delineation. In order to enhance water resources assessment, the Ministry has collaborated with other agencies including UNESCO and United States Geological Survey (USGS) to conduct groundwater assessment in some of the counties with an aim of understanding the groundwater potential in these counties. These Counties include: - the southern parts of Turkana County and the whole of Marsabit County are being assessed by USGS, while the Ministry has engaged a consultant to assess the groundwater potential in Wajir County. The mapping for Wajir, Turkana and Marsabit Counties was finalized and the groundwater potential maps submitted.

The Ministry has initiated the process of mapping of mandera county, Athi and Tana Basin areas covering 17 counties. The Ministry is in the process of engaging a consultant to undertake Mapping of Mandera County. The Collaboration created with USGS in Mapping Marsabit and Turkana county has been extended to Map the seventeen counties in Athi and Tana basins.The process is in the initial stage.

ii. Upgrading of countrywide Hydromet stations

The Project aims at providing adequate infrastructure for hydrological observations in the country. The project objective is to upgrade river gauging stations to record and transmit data in real time for proper water resources management. The economic and social benefits of the project include efficiently managed Water resources with

sufficient knowledge and enable floods and drought to be predicted thereby providing adequate mitigation measures to be taken. The Ministry has been upgrading stations to telemetric to improve reliability and timeliness of the data. In 2021/2022 the Ministry through the IGAD HYCOS programme upgraded a total of 4No. of stations to telemetry. The Upgraded stations were 5DA08 in Ewaso Ng'iro Basin at Isiolo 2EC02 in Rift Valley basin area and 2No. stations at Ruiruaka and Kirichwa Kubwa in Athi Catchment.

iii. Sustainable management of Lake Turkana and its river basin:

Lake Turkana is the world's largest permanent desert lake and the largest alkaline lake. More frequent and prolonged droughts in the region, together with a rapidly growing population, have caused degradation. A history of tension over competition for water and grazing areas causes large losses of livestock and regular requirements for humanitarian aid. Currently, the region is facing the worst drought in decades, claiming many lives -both human and livestock- while escalating transboundary armed conflicts. In order to ensure sustainable management and development of the Lake Turkana and its River Basins, the Government of Kenya and Government of Ethiopia formed and operationalized steering and technical committees in 2017/2018 financial year. In order to restore the receding lakes levels, the sustainable management and development is required. The Government of Kenya has installed 30 telemetric Hydromet stations in the Lake Turkana and its river basin to monitor the lake and river water levels. By the end in 2020/2021 financial year additional 3 telemetric Hydromet stations were installed, assessment of water resources status in the catchments areas of the lake was conducted, developed catchment micro management plan, degraded hotspots in the basin identified and installed observatory monitoring remote sensing networks. In the end of 2021/2022 additional 5 hydromet stations were designed for Weiwei tributary, rehabilitated degraded catchment areas through tree planting in Kongelai, Kacheliba and Suam Sub catchments. Also, groundwater recharge zones in the river basin were mapped. The next phase of the project is to conduct basin wide green villages program and water quality and quantity surveillance to determine water seasonal variability.

iv. Kocholia Multipurpose water resources project:

The Kocholia multipurpose project consists of a 43 m high dam with approximate capacity of 66.9million cubic metres of water. The project aims at supplying water for irrigating 2000 hectares horticultural lands, to generate electricity and water supply to communities. The project will boost food security, water supply and enhance socio-economic development in Busia and Bungoma Counties. The estimated total cost of the project is about Ksh.. 5.7 billion. The location of the project is in Malakisi River Basin. Also, community sensitization and stakeholders' forums have been ongoing since 2018 to date. In the end of this financial year 2020/2021 financial year 5 telemetric hydrolmet stations were installed in Malakisi River Basin, catchment rehabilitation activities such as soil conservation, tree planting, tree nursery prepared, spring

protection and a 2km riparian pegging in Toloso Sub catchment. Also, tree planting, tree nursery preparation and rainwater harvesting in Kaposokipi sub catchment was done. In 2021/2022, the implementation of SCMPs activies in the Malakisi River basin was conducted. These include capacity building of WRUA member in each WRUA, development and review of 5 additional SCMPS and development of flood integrated plan. In the next phase of the project will be conduct feasibility study and develop resettlement action plan, installation of the 5 additional telemetric hydromet stations, and catchment rehabilitation in other sub catchments.

v. Angololo multipurpose water resources project:

Angololo multipurpose water resources project is a shared project between Kenya and Uganda. The Angololo project will contribute towards increased irrigated agriculture. It is targeting to irrigate 3,300 ha of land (1,180 ha in Kenya and 2,120 ha in Uganda) when fully developed, supply water to 20,000 people and generate 1.75MW of hydro power. The project also includes an upstream integrated watershed management of about 430 km2. The project is expected to benefit at least 127,300 people from Tororo, Manafwa, and Namisindwa districts in Eastern Uganda and Busia and Bungoma Counties in Kenya through employment creation, irrigated agriculture, piped water supply, hydro power generation, and livestock and fisheries production. The estimated cost of the project is USD 1.65 million and it is being implemented by the two countries with the help of Nile Equatorial Lakes Subsidiary Action Plans. In 2020/2021 financial year, project inception report and detailed feasibility study was conducted. In the next phase of the project detailed dam designs and Environmental and social impact studies will be done. In 2021/2022, detailed dam designs and ESIA studies were done and final draft of Sio Malaba Malakisi MoU was submitted to Attorney General for further actions. In the next phase resettlement action plan will be developed.

## 2.7 Status of Water Supply and Sewerage

### 2.7.1 Introduction

The Water Act 2016 was developed in consultation with County Government and enacted in 2016. This Act caused transition of Water Sector Institutions and expanded their mandates as follows;

a) Water Services Regulatory Board (WASREB) – is established under the Water Act, 2016 to regulate water and sewerage services provision, including issuing of licenses, setting service standards and guidelines for tariff and prices.

b) Regional Water Works Development Agencies (WWDAs) - are established by Section 68 of the Water Act 2016 to undertake the development, maintenance and management of the national public water works within its area of jurisdiction; operate the waterworks

and provide water services as a water service provider in certain circumstances; provide reserve capacity for purposes of providing water services during transfer of water services functions from a defaulting water services provider; provide technical services and capacity building to such county governments and water services providers within its area as may be requested; and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution and this Act. They took are the successors of the Water Services Boards.

c) Water Sector Trust Fund (Waterfund) - is established under the Water Act, 2016 to provide conditional and unconditional grants to Counties, in addition to the Equalization Fund and to assist in financing the development and management of water services in marginalized and underserved areas. This includes community level initiatives for the sustainable management of water resources, development of water services in under-served rural areas, development of water services in the under-served poor urban areas, and research activities in the area of water resources management, water services, sewerage and sanitation. It took over from the former Water Services Trust Fund.

d) Water Tribunal (WT) - is established under Section 119 of the Water Act 2016 to hear and determine any dispute concerning water resources or water services where there is a business contract, unless the parties have otherwise agreed to an alternative dispute resolution mechanism. However, the WT has not been operationalized due to problem with the law where the Act gave the WT a chairman but no members of the Board. It is proposed that this be corrected through amendment of the Act. It is set to take over from Water Appeals Board.

e) National Water Harvesting and Storage Authority (NWHSA) - is established under the Section 30 of the Water Act, 2016 with a countrywide mandate to undertake the development of national public water works for water resources storage and flood control on behalf of the national government; and maintain and manage national public water works infrastructure for water resources storage; collect and provide information for the formulation of the national water resources storage and flood control strategies; develop a water harvesting policy and enforce water harvesting strategies; undertake on behalf of the national government strategic water emergency interventions during drought; and, advise the Cabinet Secretary on any matter concerning national public water works for water storage and flood control. It took over from National Water Conservation and Pipeline Corporation

All the Institutions which were proposed under the Water Act 2016 have been established except Water Tribunal.

### *Other Water Institutions*

f) Kenya Water Institute (KEWI) which was transformed into a semi-autonomous institution in July 2002 through the Kenya Water Institute Act of 2001, provides training, research and consultancy services in the water and irrigation sector.

g) Regional Centre on Ground Water Resources Education, Training and Research established under Legal Notice No.252 of 18th December, 2015, to build knowledge and information on ground water potential and undertake training and research on ground water resources.

h) Hydrologists Registration Board (HRB) is established under the Hydrologists Act No. 19 of 2017. The Board's mandated is to regulate hydrologists profession and Practice in the country.

### 2.7.2 Analysis of Water Supply and Sanitation Projects in the Ministry

Over the last five years, the Ministry has been able to complete a total of 116 water and sanitation projects worth Ksh. 205 billion. This has led to an increase in population with access to safe water by 8.6 million.

The Ministry is currently implementing a further 167 key water and sanitation projects valued at KSh 661 billion. These projects are at different completion levels with 78 of them being more than 50% complete and are targeted to be complete by 2022.

The Ministry has planned to undertake 57 dams across the country in order to increase the water storage capacity by 2,250 million Cubic Meters. Out of these, six big dams have been completed including Kiserian, Maruba, Theta, Chemususu, Karimenu, Yamo and Thiba dams with a cumulative capacity of 37.8 million Cubic Meters. Four medium sized dams have also been completed including Thangatha, Ura, kianjuri and Wamba with a cumulative storage of 750,000 cubic meters. Five (5) of the Dams are under construction valued at Ksh.. 92.7 billion with a cumulative storage of 839.8 million Cubic Meters. Two of them are more than 50% complete: Thwake and Siyoi Muruny dams. Itare dam is under DCI Investigation, Umaa and Badasa have been revived and are currently under design review before construction commences. Details of dams are attached in Annex IV.

### 2.7.3 Projects under the Big Four

The Government of Kenya has formulated and is implementing the Vision 2030 development blueprint aiming to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030. During its implementation, there were key areas that were identified as having challenges in implementation, which when unlocked would ensure that the other parts of vision would be realized faster. These areas were formulated into the Big "Four" Agenda in order to fast track their implementation.

The Ministry has been identified key enabler of the Big Four Agenda. The drivers for the agenda have identified the projects that will be implemented as well as the budgets and timelines for implementation. The projects that are key to achievement of the priority objectives are outlined for each of the four groups.

### *Manufacturing*

The projects that will support Manufacturing have been identified by the driver and will mainly be in Nairobi, Mombasa and Machakos Counties. Constituency Industrial Development Centres will however be spread across the country. These projects include supply of water to Naivasha Industrial Park; Kenanie Leather Industrial Park; Dongo Kundu SEZ; and Konza Technopolis Complex

The cumulative cost of the projects is Ksh. 4.4Billion. A total of Ksh. 3.5Billion has been utilized so far and Ksh. 264Million allocated for the financial year 2020/21 for the Kenanie Leather Park and Naivasha Industrial Park phase II projects, while Ksh.. 170Million has been allocated for the other projects in the FY 2021/22. The construction of water to Naivasha Industrial Park is currently 97% and phase I of Dongo Kundu has been completed. The Projects are tabulated in Annex V.

### *Food and Nutrition Security*

Under the Food and Nutrition Security pillar of the Big Four Agenda, the Ministry targeted to put additional 700,000 acres under irrigation to increase the area under irrigation to 1.2 million acres by the year 2030. Most of the irrigation projects contribute to the Food and Nutrition Security pillar and they include National Expanded Irrigation Programme; Mwea Irrigation Development project (Thiba Dam and Irrigation Area), Galana Kulalu Food Security model farm; Ahero irrigation scheme; Bunyala irrigation schemes, Rwabura Irrigation Development Project; Bura Irrigation Scheme; Community Based Irrigation Projects; Small Holder Irrigation Programme; Turkana Irrigation Development Project; Lower Kuja & Lower Sabor Irrigation projects, Household Irrigation Water Harvesting project, among others.

The water projects that will support Food and Nutrition Security include connection of water supply to fish landing sites and fish markets at the coast and supply of water to livestock holding grounds located in various counties across the country.

The cumulative cost of the irrigation projects is Ksh. 216.1 Billion. A total of Ksh.. 13.2 Billion has been allocated for the current FY for irrigation projects, while Ksh.. 11.1 Billion has been allocated for the FY 2022/23. The Projects are tabulated in Annex V.

The cumulative cost of the water projects is Ksh. 495Million. A total of Ksh.. 265Millionhas been allocated for the current FY for water projects but there have not been any exchequer releases, while Ksh. 230Millionhas been allocated for the FY 2021/22. The Projects are tabulated in Annex V.

### *Affordable Housing*

The Driver has identified Housing Projects that will be implemented mainly in Nairobi and Machakos Counties. These projects will however require to be supplied water from Key Projects that have not been outlined by the driver as part of the Affordable Housing. Projects identified to support Affordable Housing include water and reticulation for Park Road, Starehe,

Shauri Moyo, Utawala, Mihango, Ruai, Githunguri, Kibera B, Mariguini and East Africa Portland Housing Projects. Others include Mavoko water supply and sewerage projects.

The cumulative cost of the projects is Ksh.. 15.3Billion. A total of Ksh.. 2.8Billion has been utilized so far for Mavoko Drinking Water Supply Project, while Ksh.. 1.125Billion has been allocated for all projects in the FY 2021/22. The allocated amounts in FY 2020/21 was not released for the projects. The project details are provided in Annex V.

### *Universal Health Coverage*

The driver has identified 56 level 4 hospitals, 435 level 3 hospitals and 2576 level 2 hospitals that require to be supplied with reliable water supply. These hospitals will either be connected to existing water supplies or have individual projects developed for their water supply. The projects are located in all the counties countrywide.

The cumulative cost of the projects is Ksh.. 25.9Billion. A total of Ksh.. 357Million was allocated in FY 2021/22 for implementation of 109 priority facilities. By end of June, 2022, nine (9) level 4 facilities, ten (10) level 3 facilities and four (4) level 2 facilities had been completed. Project details are in Annex V.

### *Other Key priority projects supporting the Big Four Agenda*

The Ministry is implementing other Key Projects that will supply water to the sites where the Big Four Projects are being implemented. These projects are considered as the drivers to the Big Four Agenda. These projects include Aberdare Bulk Water Project; Thwake Multipurpose Water Development Programme Phase I; Mwache Dam and Water Supply Project; Mzima II Pipeline; Northern Collector Tunnel; Ruiru II dam; Karimenu II dam; Ndarugu I Dam and Water Supply; Maragua IV Dam and Water Supply; and Kenya Towns Sustainable Water Supply and Sanitation Programme.

The cumulative cost of the projects is Ksh.. 167.9Billion. A total of Ksh.. 41Billion had been utilized so far and Ksh.. 18.6Billion allocated for the 2020/21 FY, while Ksh.. 24.5Billion has been allocated for all projects in the FY 2021/22. These Key Projects are listed in Annex V.

### 2.7.4 Trend in Water Coverage;

The Ministry has been undertaking monitoring of provision of water services nationally on an annual basis. This is in order to track the impact of the investment that the Government has been putting on increasing access to safe water.

The data obtained is mainly from WWDAs and WSTF who are the major implementers of water supply and sanitation bulk projects. It is important to note that the impact of each project is only realized once the project is completed and has started operating.

Over the last six years, the water coverage by population increased from 58.0% in FY 2014/15 to 70.0% in FY 2020/21. This is distributed in different Water Works Development Agencies as shown in Table 8.

## Table 8: Population and percentage coverage for WWDAs for the last 6 years

| WWDA | | LVS | R. Valley | LVN | Tanathi | Northern | Tana | Coast | Athi | North Rift | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015/16 | Pop. Within WWDA | 7,538,489 | 7,784,423 | 6,461,963 | 4,368,882 | 3,305,213 | 3,669,515 | 4,055,860 | 7,373,989 | N/A | 44,558,334 |
| | Pop. Served | 3,314,139 | 5,162,144 | 3,797,078 | 1,785,614 | 2,037,622 | 2,543,329 | 2,140,208 | 5,503,529 | N/A | 25,832,883 |
| | %age Pop. Served | 44.0% | 66.3% | 58.8% | 40.9% | 61.6% | 69.3% | 52.8% | 74.6% | N/A | 58.0% |
| 2016/17 | Pop. Within WWDA | 7,704,332 | 7,955,677 | 6,604,123 | 4,464,995 | 3,377,926 | 3,750,243 | 4,145,088 | 7,536,214 | N/A | 45,538,598 |
| | Pop. served | 3,513,176 | 5,398,266 | 4,041,726 | 1,887,714 | 2,174,136 | 2,700,174 | 2,257,940 | 5,751,047 | N/A | 27,290,543 |
| | %age Pop served | 45.60% | 67.85% | 61.20% | 42.28% | 64.36% | 72.00% | 54.47% | 76.31% | N/A | 59.93% |
| 2017/18 | Pop. Within WWDA | 7,873,824 | 8,130,698 | 6,749,411 | 4,563,223 | 3,452,239 | 3,832,746 | 4,236,278 | 7,702,007 | N/A | 46,540,427 |
| | Pop. Served | 3,566,433 | 5,731,048 | 4,163,852 | 2,025,987 | 2,408,140 | 2,682,575 | 2,800,701 | 6,009,646 | N/A | 28,854,561 |
| | %age Pop. Served | 45.29% | 70.49% | 61.69% | 44.40% | 69.76% | 69.99% | 66.11% | 78.03% | N/A | 62.00% |
| 2018/19 | Pop. Within WWDA | 8,047,045 | 8,309,570 | 6,897,895 | 4,663,612 | 3,528,187 | 3,917,065 | 4,329,474 | 7,871,448 | N/A | 47,564,296 |
| | Pop. Served | 3,607,829 | 5,966,992 | 4,269,405 | 2,107,548 | 2,500,941 | 2,750,262 | 3,140,264 | 6,136,571 | N/A | 29,904,258 |
| | %age Pop. Served | 44.83% | 71.81% | 61.89% | 45.19% | 70.88% | 70.21% | 72.53% | 77.96% | N/A | 62.87% |
| 2019/20 | Pop. Within WWDA | 8,224,080 | 8,492,381 | 7,049,649 | 4,766,211 | 3,605,807 | 4,003,240 | 4,424,722 | 8,044,620 | N/A | 48,610,711 |
| | Pop. Served | 3,707,829 | 6,111,992 | 4,489,405 | 2,420,548 | 2,550,941 | 2,800,262 | 3,270,264 | 6,504,571 | N/A | 31,855,811 |
| | %age Pop. Served | 45.09% | 71.97% | 63.68% | 50.79% | 70.75% | 69.95% | 73.91% | 80.86% | N/A | 65.53% |
| 2020/21 | Pop. Within WWDA | 8,391723 | 8,665,493 | 7,193,351 | 4,863,367 | 3,679,309 | 4,084,843 | 4,514,917 | 8,287,144 | 6,078,878 | 49,680,147 |
| | Pop. Served | 3,707,829 | 7,140,894 | 5,407,605 | 2,474,948 | 2,592,641 | 2,817,762 | 3,625,624 | 7,009,871 | 3,165,697 | 34,777,174 |
| | %age Pop. Served | 44.18% | 82.41% | 75.17% | 50.89% | 70.47% | 68.98% | 80.30% | 84.59% | 52% | 70.0% |
| | | | | | | | | | | | |
| Additional People Served (5yrs) | | 393,690 | 1,978,750 | 1,610,527 | 689,334 | 555,019 | 274,433 | 1,485,416 | 1,648,342 | - | |
| Additional Pop. Growth (5yrs) | | 853,234 | 881,070 | 731,388 | 494,485 | 374,096 | 415,328 | 459,057 | 834,615 | - | |
| %age Additional Pop. Served | | -0.91% | 10.44% | 11.49% | 0.1% | -0.28% | -0.97% | 6.39% | 2.6% | - | |

Table 8 shows the data that was used to compute percentage coverage by population for each of the WWDAs. The trend of growth in coverage is presented in Figure 12.

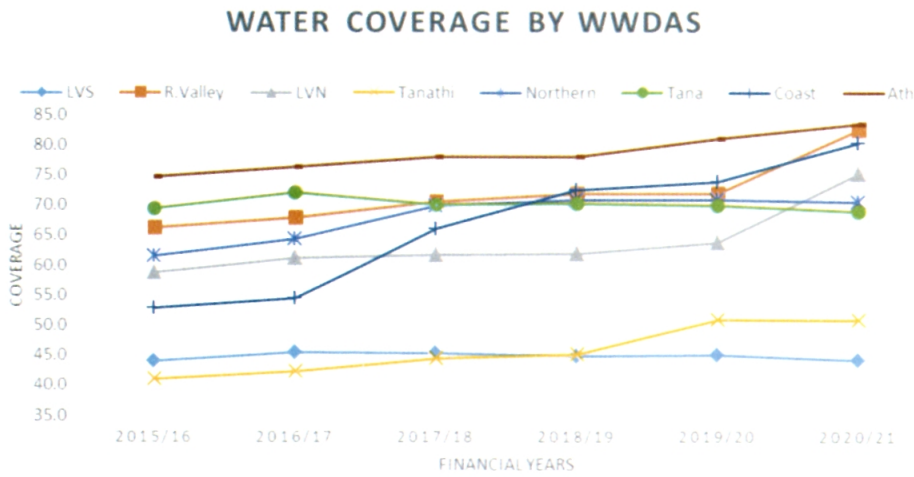



Figure 12: Comparison of water coverage by various WWDAs for the last 5 years

As shown in Figure 12, different WWDAs have achieved different results in the last five years. This is attributed to number of projects that have been completed in each over the duration. Athi WWDA has the highest coverage of 83.46% influenced mostly by better coverage in Nairobi. Tanathi and Lake Victoria North WWDAs have the lowest coverage at 50.89% and 44.18% respectively. This can be attributed to project completion rates. Some of the key projects completed in each Agency area are as follows:

a) Athi WWDA: Karimenu II dam water project, Machakos Water project, Ithanga water supply, Nairobi City Water Distribution network; Kiambu-Embakasi transmission line and Kabete-Uthiru-Karen, Kiambu County community Water Supply Project, Gatundu Water and sanitation project, and Northern Collector Tunnel phase 1, Sasamua-Kabete line, Gatanga Community water supply, Ruiru II dam and Water treatment plant and Kigoro Treatment Plant. These projects are serving 647,303 people.

b) Lake Victoria South WWDA: LVWATSAN program, Mokubu dam, Homabay IWWRM, Isebania Water Supply Project, Keroka Water Supply Project Siaya - Bondo Water and Sanitation Project, Water Sector Development for Kericho, Kisii, Nyamira and Litien. These projects are serving 420,000 people

c) Rift Valley WWDA: Chemususu dam water supply project, Rutara dam phase 1, Malaba water supply, Kiptogot-Kolongolo water supply, Ugunja-Sega- Ukwala water supply, Kendu-Bay water supply and sanitation project, Oyugis water supply and sanitation project, Kilgoris-Logorian Water supply and sanitation project, Nandi Hills water supply and Sanitation project and Last mile connectivity works for Migori and Isebania Towns. These projects are serving 795,512 people.

d) Lake Victoria North WWDA: Vihiga Cluster water project, Malaba Water Supply project, Kiptogot-Kolongolo water Supply project, Nandi Hills water project, Chepyuk Ward-Kibabii complex Water Project. These projects are serving 505,000 people

e) Coast WWDA: 3No. Replacement boreholes at Baricho, Watamu Lot 2A distribution network, Pemba intake and Treatment, Jomvu Model Health Center Water Project, Mbulia pipeline extension, Mbela Secondary school pipeline extension, Garsen town borehole and piping, Mikinduni borehole and piping and Installation of submersible pump at Madogo borehole. These projects are serving 355,360 people.

f) Northern WWDA: Yamo Dam, Masalani Water Supply, Drilling and Equipping of Baragoi Town borehole, Moyale Water supply rehabilitation, Kursin Water Supply, Isiolo Water and Sanitation Project. These projects are serving 25,000 people.

g) Tana WWDA: Chuka Water supply project, Murang'a urban water supply project, Murang'a South water supply project, Marsabit water supply project and Isiolo Water supply project. These projects are serving 17,500 people.

h) Tanathi WWDA: Wote Water Supply & Sanitation Project, Masinga - Kitui Water Supply Project, Water and sewer reticulation-East Africa Portland Housing project, Mavoko Drinking Water supply and sanitation, Machakos Water Supply project. These projects are serving 50,000 people.

i) NRVWWDA: Kipkarren dam water supply project, Merur Water Project, Kapcherop upstream project, Kapenguria-Makutano Water Project and Leseru Water Project.

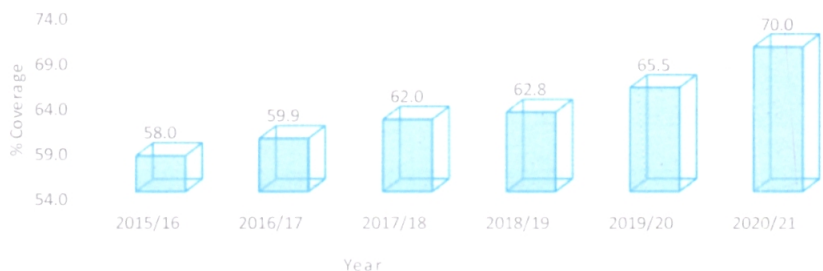



Figure 13: Trend of national water coverage for the last 5 years

As shown in Fig 13, the overall water coverage however has been on a steady rise from 58.0% in FY 2015/16 to 70.0% in FY 2020/21. The WWDA that has contributed most in this rise is Coast which has had a lot of intervention in major projects as shown in Annex I.

The Water Sector Trust Fund has been implementing various projects both in the Urban Poor and Rural Marginalized areas. This has been having impact in these areas. In the last 5 years, Waterfund has been able to increase the population with access to safe water by 0.9 Million through implementation of projects by water user associations and water utilities. This is shown in Table 9.

Table 9: Population and percentage Water coverage by Waterfund Rural Marginalized/ Underserved and Urban Poor in the last 5 years

| National Population | 2017/2018 | 2018/2019 | 2019/20 | 2020/21 | 2021/22 | Totals |
|---|---|---|---|---|---|---|
| | 46,540,427 | 47,564,296 | 48,610,711 | 49,680,147 | 56,082,000 | 56,082,000 |
| Rural Marginalized/ Underserved and Urban Poor Pop Served | 248,160 | 336,496 | 163,455 | 58,597 | 87,127 | 893,835 |
| % of Pop Served | 0.5% | 0.7% | 0.3% | 0.1% | 0.2% | 1.6% |

### 2.7.5 Trend in Sewerage Coverage

For the last 5 years, the sewerage coverage has increased from 20.1% in 2014/15 to the current 31.1% in 20/2021 There was however a period where the population grew at a higher rate than the number of connections that were done indicating a slight reduction in the urban sewerage coverage.

### 2.7.6 Projected Water and Sewerage Coverage

The management of water services is a shared responsibility between the National Government and County Governments. The National Government through the Ministry majorly develops water supply infrastructure while each of the County Governments are charged with the responsibility of service provision including development of distribution networks and actual services connections. The Ministry is targeting to ensure universal coverage to water and sanitation services by 2030. The short-term targets to be achieved by 2027 are;

- Achieve a national coverage of 90% for water services by 2027 from 60% in 2017
- Achieve a national coverage of 90% for sanitation services by 2027 from 67.2% in 2017
- Achieve a 70% coverage of Sewerage services in Urban areas by 2027 from 25% in 2017

The Ministry has adopted the following strategies to ensure achievement of the target for water coverage;

1. Complete all the 198 ongoing projects by 2024 at an average cost of Ksh. 49 Billion annually.

2. Mobilize resources for the construction of 51 projects proposed at an average cost of Ksh. 23 billion annually.
3. Reduce Non-Revenue Water from the current 40% to 20% by 2030.

### 2.7.6.1 Projected Water Coverage

The water coverage will be achieved by actively carrying out last mile water connectivity to about 200,000 households per year. This will only be possible with close collaboration between the National Government (constructing major infrastructure) and County Governments (carrying out Service Provision and last mile water connectivity)

Based on the water coverage of 70.0% in mid-2022, projects were identified (Annex II) that will be completed on or before the year 2024. The list has been revised and updated to reflect the effects of Covid-19 on funding levels. Their impact was assessed at projected water coverage was carried out as shown in Figure 14.

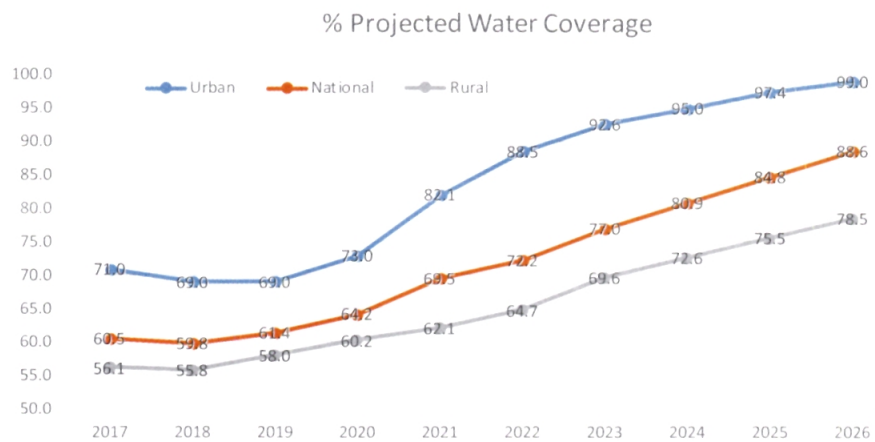



Figure 14: Projected Water coverage to be achieved on or before year 2026

The graph shows that there will be a slow growth in coverage owing to the small number of projects being completed in 2019 and 2020. The high growth rate of coverage in 2021 and 2024 is expected as most of the high impact projects will be complete and connected during that period.

It is important to note that the water that will be recovered from Non-Revenue Water when the dilapidated distribution systems of Water Services Providers are improved has not been factored in the above projections.

### 2.7.6.2 Projected Sewerage Coverage

Sewerage coverage in the country is targeted on urban areas where there is a higher density of population. Currently, about 31% of Kenyans live in urban areas, a proportion which is growing.

In order to achieve 45% sewerage coverage by 2026, the last mile sewerage connectivity will have to be done for 350,000 households annually. There is therefore need for National Government (which undertakes constructing major infrastructure) to closely collaborate with and County Governments (which is tasked with carrying out Service Provision and last mile water connectivity)

Based on the urban sewerage coverage of 31 % in mid-2022, projects were identified (annexed) that will be completed on or before the year 2024. Their impact was assessed and projected sewerage coverage was carried out as shown in Figure 15.

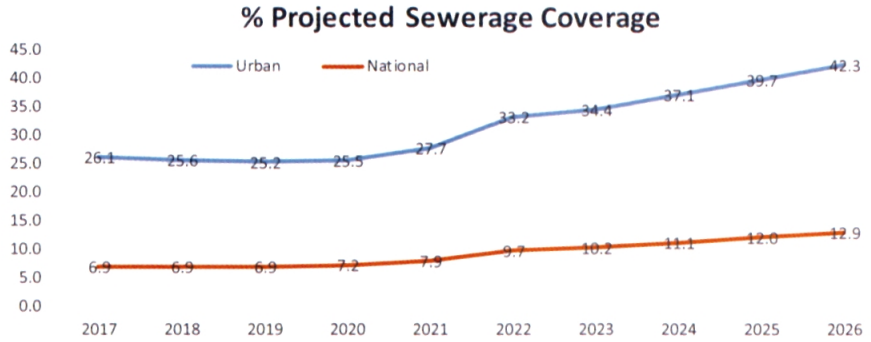



Figure 15: Projected Sewerage coverage to be achieved on or before 2026

Figure 15 above shows a maintenance of sewerage coverage in 2018 and 2019 then a gradual increase up to 2022. Even though there are projects that were completed in the period between 2017 and 2019, the population grew almost at the same rate as the additional number of people that were served with sewerage services (average population growth rate of 2.2% per annum). The number of people to be connected in 2020 to 2022 will be much higher that the growth rate owing to the number of sewerage projects that will be completed by then.

These statistics was based on the following assumptions;

1. That when a project is completed, connections will be progressively made over three years after completion.
2. The project designs are usually at an ultimate time in future, so even if all connections were made, they would not amount to the people served at ultimate design.
3. That no person is served before the projects are completed.

The risks identified that can make the above targets not be achieved are;

1. Most projects have a completion date of 2022 to 2024 including those which have not been designed. Projects that are likely to delay will impact on the overall coverage.
2. Achievement of the coverage heavily relies on the number of connections made after project completion. Last Mile Water Connectivity must be mainstreamed.
3. Any delay in project implementation has a direct impact on achievement of the targets.
4. It is imperative that the budget and cash flow projections for these projects be increased to ensure that they are completed in time.

## 2.8 Status of Sanitation

To strengthen the coordination of Sanitation, the Ministry has created a fully-fledged Sanitation Department and is in the process of staffing it with the required human resources as per the approved establishment.

### 2.8.1 Sanitation in Rural marginalized/underserved and urban poor

The Ministry through Water Sector Trust Fund (WSTF) has been implementing various projects both in the Urban Poor and Rural Marginalized areas. This has been having impact in these areas. In the last 5 years, WSTF has been able to increase the population with access to safe water by 569,467 through implementation of projects by water user associations and water utilities. This is shown in Table 10.

Table 10: Population reached with sanitation services by Water fund in rural marginalized/ underserved areas and urban poor

| National Population | 2017/2018 | 2018/2019 | 2019/20 | 2020/21 | 2021/22 | Totals |
|---|---|---|---|---|---|---|
| | 46,540,427 | 47,564,296 | 48,610,711 | 49,680,147 | 56,082,000 | 56,082,000 |
| Rural Marginalized/ Underserved and Urban Poor Population Served | 129,360 | 121,984 | 167,130 | 192,273 | 74,548 | 685,295 |
| % of Population Served | 0.3% | 0.3% | 0.3% | 0.4% | 0.1% | 1.2% |

## 2.9 Status of Irrigation and Land Reclamation

### 2.9.1 Irrigation

According to the Water Master Plan, the country's irrigation potential is estimated at 1.913million acres (765,200 ha) without water storage and can go up to 3 million acres (1.2 million ha) with storage. The Government in 2013 developed a strategy to incresae national irrigation coverage by 140,000 acres annually to bridge the gap in the next 10 years. The strategy has seen the irrigation coverage progressively increased to the current 664,000 acres, accounting for 35% of the potential without water storage. Out of the country's total arable land only 5.9% is equipped with irrigation infrastructure. The opportunities for irrigation investments may be unpacked as in Figure 16.




Figure 16: Opportunities for irrigation investments

#### 2.9.1.1 Expanded Irrigation Programme

With the success of the Economic Stimulus Programme (2009-2011) directly and indirectly benefiting estimated 1.2million households, the government initiated the National Expanded Irrigation Programme. In the Budget Statement to Parliament for Financial Year 2011-2012, the Minister for Finance allocated KSh 8.5 billion for initiating a comprehensive country-wide Irrigation Expansion Programme.

The Programme involves provision of irrigation infrastructure for abstraction, conveyance, distribution and application of irrigation water for the various irrigation projects. The project targeted interventions in 610 projects across the country to bring an additional 531,574 acres. For sustainability and reliability of irrigation water, the sector also embarked on providing water storage for irrigation. In arid areas, development initiatives focused on provision of water storage reservoirs and installation of greenhouses. The water pans provide water for domestic and animal consumption while greenhouses supplement local community's nutritional needs and provide a source of income for women and youth groups.

Since 2011, the achievements under the National Expanded Irrigation Programme can be summarized as follows: -

- Rehabilitation, expansion and modernization of public irrigation schemes that has seen the irrigation area increase from 23,055 acres to 63,342 acres.
- Over 240 irrigation projects have been constructed across all the 47 Counties under the Expanded National Irrigation Programme (ENIP) with cumulative total area of 230,866 acres directly benefiting over 267,426 farmers at a cost of Ksh. 32.31 billion translating to Ksh. 139,972 per acre. The initiative, together with others, aims at continually bringing down the cost of construction of irrigation infrastructure so that it can be affordable to more farmers.
- Completed feasibility studies and detailed designs for over 38 projects covering 430,000 acres.

In addition, to increase reliability of irrigation water, water-harvesting initiatives have also been carried out under the programme that includes: -

- Completed feasibility studies and detailed designs for 11 water storage reservoirs with a cumulative total of 1.3billion m3
- 28,732 household water pans with a combined potential volume of 39.9 million m3 have been constructed in 31 counties to irrigate about 38,904 acres and benefitting 28,732 households.
- 1,812,000 m3 has been realized under the Post Covid-Economic Stimuls Programme (PC-ESP) through Spate Irrigation for Climate Resilience in Samburu, Marsabit & Isiolo counties and Water Security & Climate Adaptation in Mandera & Wajir clusters.

#### 2.9.1.2 Micro-Irrigation for Schools Programme

The project involves constructing micro irrigation facilities in 2000 schools to enable about 2,000 acres in schools to be put under production. The project involves drilling boreholes to benefit 2000 schools with water across the country annually.

It is an intervention to build the capacity of young Kenyans in schools to appreciate and actively participate in agriculture. The former 4K Clubs in schools created a mentality that agriculture and other farming investment is futile as it gave poor returns. This nearly led to less interest in agriculture in our learning institutions. Micro-irrigation programme for schools is intended to reverse this. Water sources from boreholes and small dams supply water to institutions and pilot commercial agriculture with intensive irrigation in greenhouses. With secured income and sustainable water availability the intervention has attracted a lot of interest.

The Project was initiated in 2016. In 2021/22 FY 11 schools have been equipped with micro-irrigation facilities. In total 81 boreholes have since been drilled and equipped benefiting 120 public schools. In addition 63 pilot green houses for vegetable growing and tree/fruit

seedlings production. The Programme also benefits over 39,000 people in communities neighboring the schools.

### 2.9.1.3 Ongoing Irrigation projects

During the period the Ministry did and continues to undertake the following irrigation interventions: -

i. Construction of Thiba dam to store about 15.4 million m3 of water and irrigation infrastructure under Mwea irrigation development project that will see the area increase from 25,000 to 35,000 acres and support production of a second crop. The dam construction is complete, 8.8 million cubic meters of water has been impounded and the dam continue to be filled with water. The gates have been opened to release water downstream to the farm land for rice production.

ii. Rehabilitation of Bura Irrigation project in Kilifi and Tana River counties by converting the system from pump fed to gravity fed irrigation system and increase area from 6000 acres to 15,000 acres. The construction works has since been phased; phase 1 which deals with the intake works is currently at 76.47% and phase 2 which handles the main gravity canal is 35% complete.

iii. National Expanded Irrigation Programme and Community based irrigation projects targets to bring an additional 20,000 acres under irrigation annually. Constructed over 240 irrigation projects across the country with cumulative total area of 230,866 acres directly benefiting over 267,426 farmers.

iv. Implementation of the 10,000 acres model farm for Galana Kulalu Food Security Project. 5,100 acres have been achieved and is under production. Of the remaining 25 center pivots, 17 have been installed and tested. Equally, the main conveyance and Distribution Pipeline of 23.3 Km has been completed out of the 36 km. The project is 95% complete.

v. Construction of the 1500 acres Rwabura Irrigation Development Project in Kiambu county. The two intakes and the conveyance canal have been done and the project is now 40% complete.

vi. Construction of 10,000 acres Lower Nzoia irrigation project under the Lower Nzoia Irrigation Project under the Kenya Water Security Project financed by the World Bank and KFW.

vii. Construction of the 19,290 acres Lower Kuja Irrigation Scheme in phases where 4,000 acres has been achieved and production is going on.

viii. Completed construction of the 1500 acres Lower Sabor Irrigation Development Project under gravity-fed sprinkler irrigation system and production is going on.

ix. Construction of the 30,000 acres Turkana Irrigation Development Progrogramme in Naipa through ground water in Lotikipi aquifer where 3968 acres have been achieved.

Overal 20 projects have been completed with a total area of 19,000 acres to benefit 9.080 households and which has provided a stable supply of grains at an average of 38,000 tons of maize and millet annually.

x. Maintenance of public schemes' main infrastructure (canals), maintenance of pumps in pump fed schemes, provision of irrigation water to 50,315 acres across the schemes and capacity building for farmers through training to optimize production.

In addition to this, the sector has purposed to invest in water storage facilities that will increase reliability of irrigation water and build resilience for communities against effects of climate change. Some of the key water harvesting programmes include.

i. Thiba dam as mentioned earlier which is complete and 8.8 million cubic meters out of the dam capacity of 15.4 million cubic meters of water has already been impounded.

ii. Construction of water harvesting infrastructure for households with an aim of providing 125,000 households with localized reservoirs to supplement their irrigation needs. Constructed 28,732 household water pans in 31 counties with a combined volume of 39.9 million cubic meters to irrigate about 38,904 acres and benefiting 28,732 households.

iii. Rehabilitation of existing small dams and water pans to increase their capacity to meet irrigation demand for neighboring communities. Over 4,000 water pans were to be rehabilitated with a capacity of 400 million cubic meters across the country. To this end, water pans with a n estimated capacity of 21.6 million cubic meters have been constructed and rehabilitated for crop production and animal consumption in 31 counties.

iv. 1,812,000 m3 of water has been realized under the Post-Covid Economic Stimulus Programme (PC-ESP) jointly through Spate Irrigation for Climate Resilience in Samburu, Marsabit & Isiolo counties and Water Security & Climate Adaptation in Mandera & Wajir Clusters.

The details of ongoing projects are included in Annex II. As detailed, there are opportunities of extending the ongoing programmes for quick wins.

From the past trends and current initiatives, it is clear that the government and development partners have contributed immensely towards irrigation development. As a result, the irrigation area has increased from 354,831 acres in 2010 (NWMP, 2030) to 664,000 acres, an increase of 87%. This developed irrigation potential presents an opportunity for focused and enhanced agricultural production for strategic crops. This however requires an elaborate framework of engaging farmers to take up the production.

#### 2.9.1.4 Irrigation Development Opportunities

There is a lot be done to develop the unexploited irrigation potential of 1.393 million acres. In this regard, the completed feasibility studies and detailed designs for projects provide the next frontier in irrigation development and will be the focus of the future plans. The sector is

putting efforts towards development of extensive irrigation projects accompanied by irrigation water harvesting and storage initiatives. Besides, the sector has also embarked on catalyzing farmer led irrigation development initiatives, which has high potential for increasing area under irrigation, through diagnostic studies in collaboration with the World Bank and Water Resource Group 2030. Some of the earmarked different categories of projects whose feasibility studies and detailed investigations and designs have been carried out include: -

### *a) Irrigation projects*

i. Large scale irrigation projects

The Irrigation Act defines large-scale irrigation scheme as schemes whose area is above 3,000 acres. Towards this end, the sector has seen successful operation of the largest irrigation scheme in the name of Mwea irrigation scheme. Further to this, there are also good indications that all the large-scale projects are back in operation. Learning from this, the sector has in addition identified more large-scale projects for implementation. These projects eventually translate to strategic irrigation projects that will be the key food security projects in respective counties. These projects have been conceptualized around the available water resources to meet crop water requirements for projects covering a large area.

Feasibility studies and detailed designs for 22 projects have been carried out and are ready for implementation as detailed in Annex V. These projects will bring a total combined area of 398,731 acres and is estimated to cost Ksh. 83.7billion. This will have huge impact in the food and nutrition pillar of the big four through projected annual production of 1,068,350 bags of rice paddy, 8,502,760 bags of maize, 52,100 MT of cotton and Ksh. 75 billion worth of horticultural crops that includes irish potatoes. Further to this, the projects are projected to generate revenue amounting to Ksh. 114 billion and create 1.9 million jobs both directly and indirectly.

Studies in irrigation development have identified some projects that would depend on transboundary waters. These projects include Daua in Mandera that will use Daua river that is shared between Kenya, Ethiopia and Somali, Umba valley project whose water source is Umba river shared between Kenya and Tanzania, expansion of Challa irrigation project through the use of lake Challa which is shared between Kenya and Tanzania, Kocholia-Amagoro-Amoni using river Sio that is shared between Kenya and Uganda. There is need to purpose to conclude the memorandums of understanding with the neighboring counties to enable progress in the projects.

### *ii. Small holder/community managed irrigation projects*

These are schemes that are owned and managed by the communities with an aim of boosting their agricultural production. Smallholder Irrigation Schemes are either initiated by the government, development partners or farmers themselves. In line with the Irrigation Act 2019, the sector at the national government level, is responsible for smallholder irrigation schemes with area ranging from 100 to 3000 acres. The projects are quick wins in irrigation

development because the implementation cycle is short from identification, design and construction. The structures are fairly small making them easy to build, operate and maintain. They can also be implemented in regions with fairly limited water resource and can use different water sources including major rivers, streams, and boreholes.

These projects are well distributed in various counties across the country. The sector has earmarked 610 projects with a total area of 531,574 acres. Currently, NIA has been implementing this cluster of projects under the National Expanded Irrigation Programme and the ministry under the Community Based Irrigation Programme. As detailed in annex III, 240 projects have been identified that are at different levels of implementation. On implementation, 174,690 acres will be developed at a cost of Ksh. 42.9 billion to benefit 219,539 farmers. This has the potential of increasing maize production to 2,600,000 bags and horticultural crops valued at Ksh. 43.7 billion with proper capacity building and incentive for farmers.

### *iii. Expansion of Public Irrigation Schemes*

To realize more acreage towards achieving food security proposed expansion and modernization of public irrigation schemes will see the irrigation area increase by an additional 16,100 acres from the current 63,342 acres. The areas targeted for expansion will utilize the same water resources abstracted and conveyed by the existing infrastructure as detailed in annex IV. The estimated cost for this expansion is Ksh. 1.025billion.

### *b) Water harvesting for irrigation projects*

In recent years the water resources have been shrinking, a factor that has been attributed to climate change and other human activities hence less water is available for irrigation. To increase reliability and stabilize irrigation water, it is important to develop water storage reservoirs to store excess floodwaters for use during the dry spells.

### *i. Large dams for large irrigation projects*

The sector has initiated studies for a number of dams for various irrigation projects and proposes to undertake more studies in a bid to have a dam for each irrigation project. Currently, the construction of 15.5 million cubic meter capacity-Thiba dam for Mwea irrigation scheme is complete and 8.8 million cubic meters of water has already been impounded.

The sector in the medium term proposes to undertake 7 water harvesting and storage projects, construction of new water pans and small dams in areas that do not have perennial rivers and rehabilitation of existing water pans and small dams to increase water storage capacity by 1.14 billion cubic meters and irrigate an additional 408,400 acres at an estimated cost of Ksh. 135 billion as detailed in annex V.

### *ii. Household Water harvesting for Irrigation*

The objective of the project is to provide localized water access through construction of water harvesting and storage reservoirs for irrigation purposes at the household level by harnessing surface water (runoff) resulting from rainfall received in the reservoir areas in the arid counties. The project will be implemented across the arid areas where landowners are willing to freely cede land for excavation of the reservoir. The target is to construct household water pans with a cumulative volume of 125 million cubic meters to irrigate 125,000 acres at an estimated cost of Ksh. 16.25 billion for excavation as detailed in annex VI. During the period under review, a total of 28,732 household water pans with a potential volume of 39.9 million m3 that can irrigate 38,904 acres have been achieved.

### *iii. Rehabilitation and construction of community small dams and water pans*

Over the years, spanning from the colonial times, there has been numerous interventions of increasing access to water through harvesting and storage. It is estimated that there are over 6000 water pans and small dams spread across the country both on public and private land. These reservoirs have been a sole source of water for diverse communities. However, over time, the reservoir has silted up or breached thus reducing their capacity to hold water. The objective of this project therefore is to rehabilitate the reservoirs and increase their capacity, if possible, to be utilized again. The primary advantage of this is that land is already available eliminating the complication of land acquisition. The target is to intervene in 3,945 pans with a combined volume of m3 to irrigate 394,500,000acres at an estimated cost of Ksh. 59.2 billion as detailed in annex VI. Community water pans with a combined volume of 21.6 million m3 have been rehabilitated for crop production and animal consumption.

### *iv. North Eastern*

The Arid counties of Marsabit, Wajir, Mandera, Garissa, Samburu and Isiolo fall in the Ewaso Ng'iro North Catchment Area (ENNCA) classified as an arid land with an average mean annual rainfall is 510 mm. By hydrology, the catchment has numerous ephemeral streams that only storm water in direct response to precipitation with water flowing only during and shortly after large precipitation events. The only opportunity there is of reliably using these water resources for livestock watering and agricultural production is through provision of water harvesting and storage structures. Construction of small dams across the lagas accompanied by water pans and provision of efficient irrigation system preferably drip in greenhouses and solar powered pumps is envisaged to transform these counties to be food sufficient.

It is proposed that along the ephemeral streams, a cascade of water pans with a combined volume of 10,000,000 m3 is constructed to increase area under irrigation to 10,000 acres in each county as detailed in annex VII. The investment will increase the area under irrigation by 60,000 acres irrigated through 600 water pans with an accumulated volume of 60 million cubic meters. Upon development, the counties in the catchment will have the potential to

provide water for 108,000 sheep and goats, produce 1.5 million bags of maize and horticultural crops valued approximately at Ksh.. 15 billion annually and become food self-sufficient, build resilience against climate change and become economically empowered.

### *c) Groundwater for irrigation*

This is a relatively new area for the sector and has shown potential in enhancing food security for communities with limited surface water resources. A good example is Turkana County that has immense groundwater resources provides a unique opportunity for cotton production at large scale under irrigation. The Lotikipi aquifer alone has renewable water (slightly saline) amounting to 3.224BCM/year and can irrigate approximately 170,000 ha of cotton particularly because it also does well in saline conditions. It is proposed groundwater mapping mainly for areas with limited surface water resources be carried out followed by investing in boreholes combined with efficient irrigation technologies such as drip irrigation and centre pivots. As a pilot sector proposes to develop 23,000 acres in the arid counties using solar driven boreholes complete efficient irrigation systems at an estimated cost of Ksh. 7 billion.

### *d) Galana Kulalu Food Security Project*

The Project involves development of infrastructure for viable and economic utilization of the Galana and Kulalu Ranches through among others irrigated agriculture. The implementation plan of the project is phased comprising of 10,000-acre model farm as phase I, followed by 170,000-acre pilot farm as phase II.

The implementation of the model farm is 95% complete in terms of infrastructure development that include installation of 21 center pivots covering 3300 acres, pipes for drip irrigation covering 1800 acres installed and construction of the 2 pumping stations and one sedimentation basin which are under production. Notably, all pipe networks to distribute water in the entire 10,000 acres farm have been installed.

To complete the 10,000 acres model farm, NIA disengaged with Green Arava, the Israeli Contractor who defaulted and abandoned site, and contracted Irico International to complete the remaining works (25 center pivots, 6 pumps and 36 km of pipeline) covering 4,900 acres. Out of these, 17 centre pivot have been installed, 23.3 km of pipeline laid and construction of pump house is ongoing. Upon completion, the 10,000-acre farm will be availed to growers in the private sector for production as per agreed terms. In addition, hydrological studies indicated that the available water could irrigate an additional 10,000 acres without storage at an estimated Ksh. 3 billion.

In summary, the proposed interventions as detailed in Tables 11, 12, and 13 below will cover all regions through implementation of 5,715 projects. This is expected to increase the area under irrigation by 1,519,913 acres, provide water storage capacity of 1.5 billion cubic meters at a cost of Ksh. 330 billion to generate annual revenue of Ksh. 335 billion and create employment for over 5 million directly and indirectly.

Table 11: Summary for irrigation Projects

| | No of Counties | No of projects | Area (acres) | Cost Kshs | Value of produce annually |
|---|---|---|---|---|---|
| Large scale irrigation projects | 20 | 22 | 398,731 | 83,733,615,000 | 113,999,984,017 |
| Community managed Irrigation projects | 39 | 240 | 230,866 | 42,204,847,582 | 43,671,600,000 |
| Expansion of Public Irrigation Schemes | 6 | 9 | 1,500 | 1,025,000,000 | 3,573,837,500 |
| Groundwater for irrigation | 23 | 23 | 23,000 | 8,050,000,000 | 6,575,861,000 |
| **Total** | | **294** | **667,097** | **135,013,462,582** | **167,821,282,517** |

Table 12: Summary for Water Harvesting Projects

| | No of Counties | No of projects | Area (acres) | Volume CM | Cost Kshs | Value of produce annually |
|---|---|---|---|---|---|---|
| Water harvesting for irrigation projects - large dams | 5 | 7 | 408,400 | 1,021,000,000 | 111,680,000,000 | 27,161,165,000 |
| Water harvesting for irrigation projects - Rehabilitation of existing small dams and pans | 42 | 3,945 | 328,000 | 394,500,000 | 59,200,000,000 | 93,777,496,000 |
| Water harvesting for irrigation projects - Water for Household | 42 | 881 | 114,596 | 114,596,000 | 14,900,000,000 | 32,763,798,572 |
| Water harvesting for irrigation projects - large pans on Ewaso Ng'iro North | 6 | 600 | 60,000 | 60,000,000 | 9,600,000,000 | 15,000,000,000 |
| **Total** | | **5,433** | **910,996** | **1,590,096,000** | **195,380,000,000** | **168,702,459,572** |

Table 13: Summary for irrigation and water harvesting projects

| | No of projects | Area (acres) | Cost Kshs | Value of produce annually |
|---|---|---|---|---|
| Irrigation Projects | 294 | 667,097 | 135,013,462,582 | 167,033,782,517 |
| Water harvesting Projects | 5,433 | 910,996 | 195,380,000,000 | 168,702,459,572 |
| **Total Combined.** | **5,727** | **1,578,093** | **330,393,462,582** | **335,736,242,089** |

### 2.9.2 Land Reclamation

Land degradation is the reduction in land quality due to natural or human activities. It is a global problem which leads to increasing aridity and desertification of marginal, semi-arid and dry sub-humid lands. In Kenya, land degradation is a very slow process and land owners, policy, legal and political leadership only recognizes it at the point of severity. The long-term effect of land degradation is the losses of both ecosystem function and land productivity from which the land cannot recover unaided. Such lands are restored with reclamation and rehabilitation.

Land Degradation Assessment Report (LADA- 2012) indicates that 25.3% of Kenya's land mass is moderately severe to severely degraded and affects over 12million people. Land degradation negatively impacts environmental water conservation, leads to high surface water runoff, silting of dams and is the main cause of food and water insecurity. Land degradation occurs in the whole country with varying levels of severity but whether natural or as a result of human activity, has lowered the resilience of ecosystems and the sustainability of livelihoods and is the major driver of the commonly occurring landslides and loss of lives and livelihoods. The primary driving forces of land degradation in Kenya are inadequate Policy environment; failure to recognize land waste as a serious national problem and weak and unsustainable interventions. It is aggravated by subdivision of land into uneconomic land parcels and weak interrelationships and thresholds between the technical, institutional and policy factors at different levels in the country. The Ministry in collaboration with partners undertook the 1st national Land Degradation Assessment (LADA) covering the years 1990 to 2012 and results indicate about 25.3% of Kenya's land mass is moderately severe to severely degraded and is increasing as shown in Figure 17.

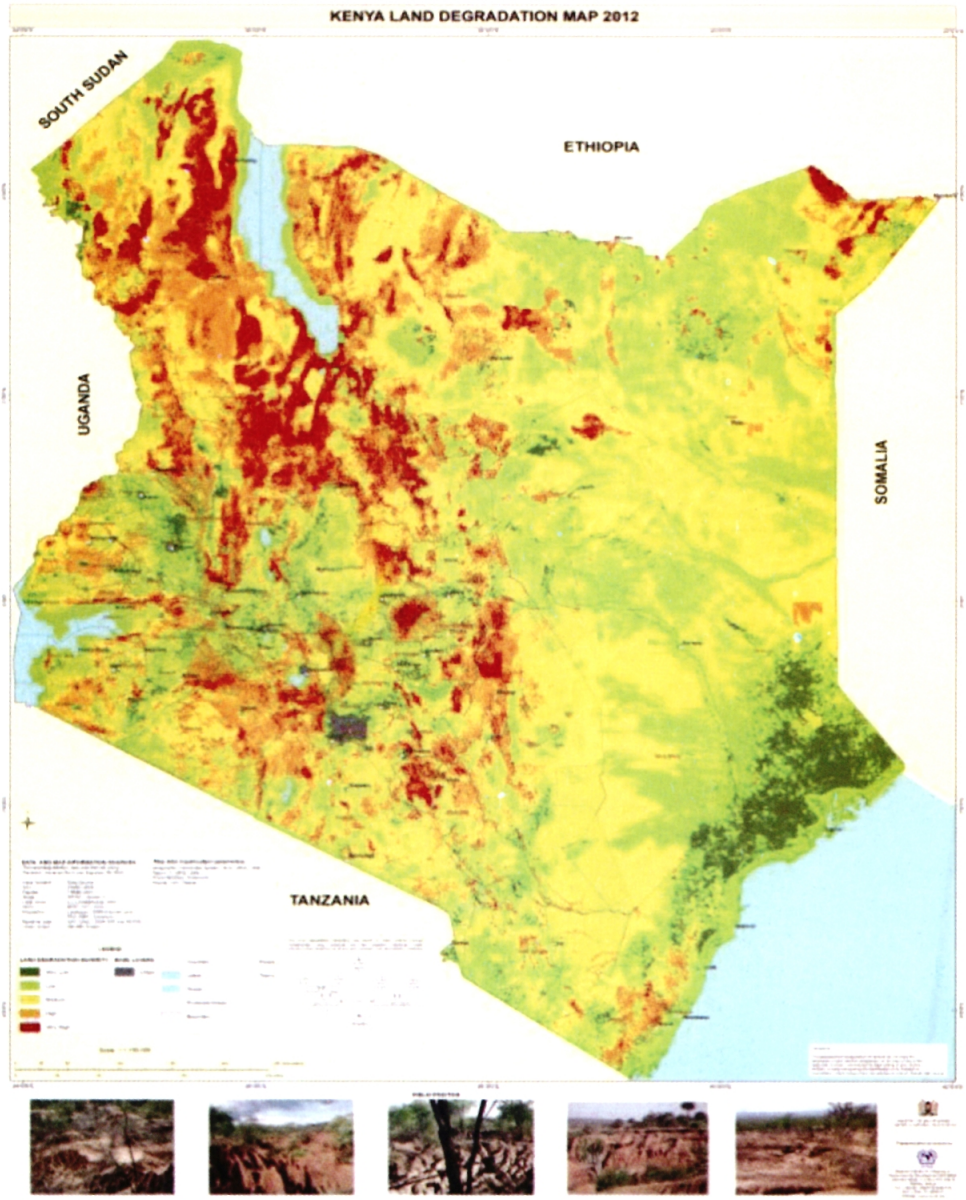
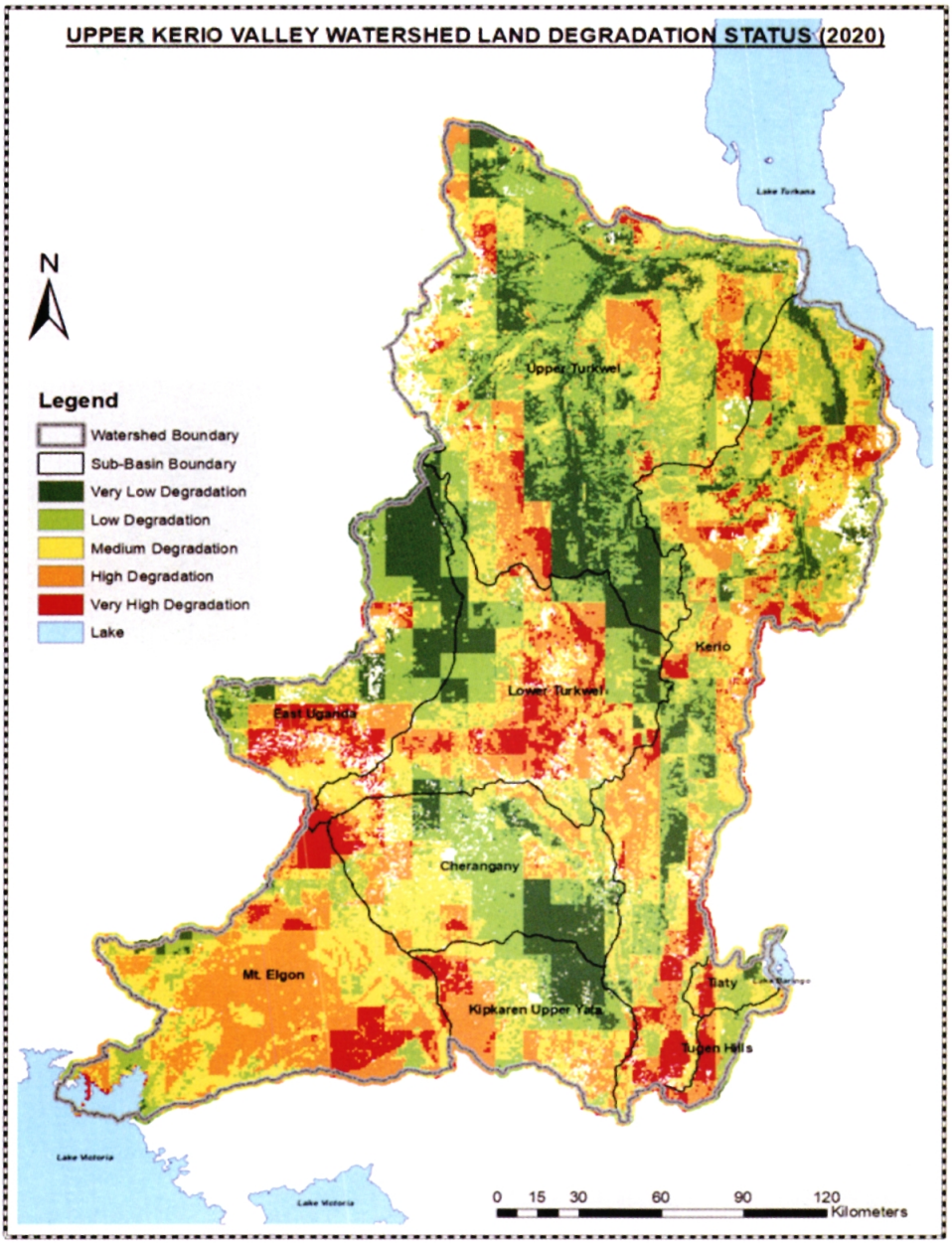
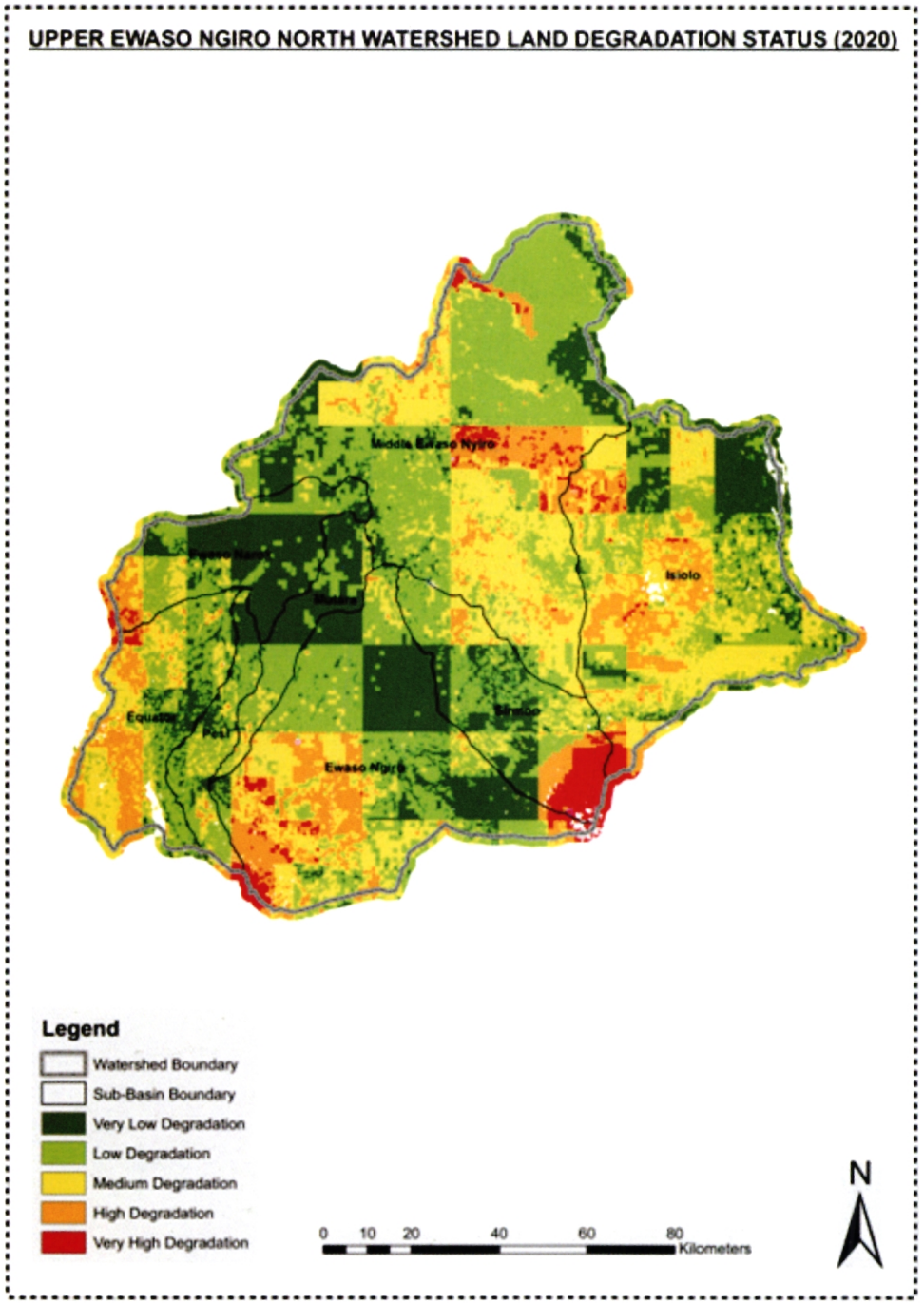



Figure 17: Land Degradation Assessment {LADA); Kenya -2012 (Source- RCMRD, UNEP and Ministry of Water and Irrigation)




*Source: LADA draft REPORT; MWS &I 2022 by Mapinfotek Geomatiks Ltd*

Figure 18: Upper Kerio Valley Land Degradation Status 2020




*Source: LADA draft REPORT ; MWS &I 2022 by Mapinfotek Geomatiks Ltd*

Figure 19: Upper Ewaso Nyiro North Land Degradation Status 2020

The Figures 20, 21, 22 and 23 below show the impacts of land degradation and reclamation interventions in various Counties in the country.



Figure 20: Highly degraded land at Mtembur in West Pokot County



Figure 21: Jila water pan in Ganze Constituency, Kilifi County used to put unproductive land under production for both crops and livestock production



Figure 22: Bare wasteland reclaimed in Wajir County.



Figure 23: Nyaoroko Pan in Gilgil, Nakuru County where Land Waste is high but 60 acres of land have been reclaimed.



Figure 24: Kamelil dam in Keiyo north where unproductive land is being utilized for vegetable production.



Figure 25: Kabinat water pan in Baringo Central where unproductive land has now been put under production through micro-irrigation



Figure 26: Land in Turkana County under reclamation

#### 2.9.2.1 Land Reclamation and Rehabilitation Program

In addressing increasing challenges of land degradation and waste, the Ministry has developed and implemented various tools including more detailed Land Degradation Assessments (LADA) that have become very useful tools for capacity building and achieving change among land owners, technical teams, professionals and policy makers. In the period under review Land degradation assessment for Upper Kerio Valley and Upper Ewaso Nyiro North River watersheds were carried out and are 90% complete. The only outstanding work is dissemination and implementation.13 outstanding watersheds shall be assessed at high resolution levels soon. In the reporting period,a cumulative total of 22,000 ha of land had been reclaimed and more land owners engaged to reverse the degradation trends and to achieve LDN on all land use activities.

#### 2.9.2.2 National Water Harvesting and Groundwater Exploitation

To enhance environmental water storage, the Ministry has developed 159 water pans, sand dams and small dams in various parts of the country achieving over 12.5million $m^3$ surface water storage. These interventions often serve as models where land owners are encouraged to replicate and with proper water management, land rehabilitation and reclamation is achieved with irrigation, re-vegetation, and land healing conservation.

## 2.10 Monitoring, Evaluation and Reporting

The Ministry has the overall mandate for water sector policy and coordination. This responsibility covers the coordination of all sector activities and resources. Sector consultations, planning and monitoring are done based on established dialogue platforms, information systems, performance reporting and the medium-term planning process.

The Monitoring, Evaluation and Reporting in the Sector is guided by the National Monitoring and Evaluation Framework, National Integrated Monitoring System (NIMES), Kenya Evaluation Guidelines and the Sector Monitoring and Evaluation Framework. Key performance indicators have been developed which are being tracked and progress reports prepared quarterly and annually using a standard M & E template.

The sector has a human right obligation to ensure every person in Kenya has the right to clean water in adequate quantities, reasonable standards of sanitation as well as food security. The achievement of this right is being monitored and reported on as well as SDG No.6 on "Ensuring Availability and Sustainable Management of Water and Sanitation for all".

The M&E system reforms which started under the Water Act 2002, and now the Water Act 2016 and Irrigation Act 2019, have brought great gains to the water, sanitation and irrigation sector. Among these gains are: the separation of policy-making from regulation, and water services provision from water resources management and irrigation services; decentralization of key functions from the national level to the regional and county level; and a stronger pro-poor focus. The reforms have also enabled the sector to adopt the Human Right to Water as a guiding principle. The Ministry has established structures and platforms for increased stakeholder and consumer participation in decision-making and implementation processes, in an effort to combat the sector challenges.

## 2.11 Performance Contracting

Performance Contracting is part of the broader public sector reforms aimed at improving efficiency and effectiveness in the management of the Public Service since the year 2003. The Ministry since the year 2007 has been impiementing annual performance contracts and has greatly improved delivery of services to the citizens. The Ministry has been undertaking self-reporting as a good governance practice and disseminating performance evaluation reports for Water Sector Institutions.

The Cabinet Secretary in the Ministry has been given the overall responsibility for negotiations, vetting, implementation, monitoring and evaluation of the Performance Contract for the Ministry and its State Corporations. That the Performance Contracting is anchored on national development priorities such Medium Term Plans of Vision 2030, Big Four, Strategic Plans, SDGs among others. In the performance evaluation results of FY2020/21, the Ministry was ranked position 6 (among Ministries) with a composite score of 3.2454 (Good category), while one of our institutions (National Irrigation Authority-NIA) had a composite score of 1.889 (Excellent category) and was ranked position one nationally. Below is the summary of Ministry and Water Sector Institutions performance for FYs 2019/20, 2020/21 and 2021/22(Note; The State Corporations under the Ministry are scheduled for performance evaluation for FY 2021/22 between, 23rd September and 28th October, 2022).

| | Composite score FY 2019/20 | Rank (National) | Composite score FY 2020/21 | Rank (National) | Composite score FY 2021/22 |
|---|---|---|---|---|---|
| Ministry of Water, Sanitation and Irrigation | 3.1500 | 5 | 3.2454 | 6 | 3.2714 |

| Rank (WSIs) | Institution | Composite score FY 2019/20 | | Composite score FY 2020/21 | | Rank (National) |
|---|---|---|---|---|---|---|
| 1. | National Irrigation Authority | 2.3539 | Excellent | 1.889 | Excellent | 1 |
| 2. | Water Resources Authority | 2.6837 | Very Good | 2.4307 | Very Good | 10 |
| 3. | Water Sector Trust Fund | 2.6448 | Very Good | 2.5041 | Very Good | 12 |
| 4. | Athi Water Works Development Agency | 3.3105 | Good | 2.7394 | Very Good | 23 |
| 5. | Lake Victoria South Water Works Development Agency | 3.0100 | Good | 2.7999 | Very Good | 28 |
| 6. | Tanathi Water Works Development Agency | 2.9677 | Very Good | 2.8427 | Very Good | 37 |
| 7. | Tana Water Works Development Agency | 4.0763 | Poor | 2.9426 | Very Good | 64 |
| 8. | Water Services Regulatory Board | 2.9873 | Very Good | 2.9902 | Very Good | 86 |
| 9. | Kenya Water Institute | 3.2828 | Good | 3.1138 | Good | 120 |
| 10. | National Water Harvesting and Storage Authority | 3.5737 | Good | 3.1199 | Good | 123 |
| 11. | Lake Victoria North Water Works Development Agency | 3.3066 | Good | 3.1212 | Good | 125 |
| 12. | Regional Centre on Groundwater Resource Education Training and Research | 3.1561 | Good | 3.1667 | Good | 139 |
| 13. | Northern Water Works Development Agency | 2.9305 | Very Good | 3.2973 | Good | 166 |
| 14. | Central Rift Valley Water Works Agency | 2.9053 | Very Good | 3.3269 | Good | 173 |
| 15. | Coast Water Works Development Agency | 3.3999 | Good | 3.5145 | Good | 203 |
| **Average** | | **3.1059** | **Good** | **2.9199** | **Very Good** | |

# 3.0 CHALLENGES, LESSONS LEARNT AND EMERGING ISSUES

## 3.1 Lessons Learnt

Lessons learnt during implementation includes:

i. There is need for continuous engagement of Parliament and National Treasury to enhance communication with project implementation agencies and grant exemption from remission of duty and taxes.

ii. Collaborative framework between the National and County governments is essential for sustainable water resource, water, sanitation, land reclamation and irrigation management.

iii. Water and sewerage projects completed and transferred in the last five years have had minimal impact due to low household connections. Thus, it is essential to incorporate household connectivity during planning stage.

iv. Adoption of advance techniques is essential to map and access large ground water resources.

v. Financing of irrigation development through cost sharing model with project beneficiaries improves the rate of irrigation development, ownership and sustainability.

vi. Adoption of climate smart irrigated agriculture, collection and timely dissemination of climate related data as well as capacity building of famers and technical officers are adaptation and mitigation measures that largely helps in reducing the effects of climate change and needs to be mainstreamed in projects.

vii. They is need to undertake studies on water-energy nexus to map the progressive energy cost of water and also adopt energy efficiency technology to reduce energy cost of water.

viii. Multi-agency approach with relevant stakeholders on security of critical water and irrigation infrastructure is essential.

ix. Covid-19 pandemic affected the implementation of programmes and projects hence there is need to put finances and other strategies in place to mitigate such occurrences.

x. Focus and financing of research and innovation in the sector to improve on absorption and utilization of new technologies.

xi. Water harvesting and storage at household level to be given priority at national and county legislation to enhance mitigation of effects/impacts of climate change (floods and drought).

Despite the progress with lessons learnt, there are still a number of challenges facing the Ministry which will be used to inform policy direction going forward. These include;

## 3.2 Key Challenges

i) High Cost of Resettlement Action Plan (RAP).

ii) Investment in the water sector is not matching the population growth. This has the effect of stagnated or recessing growth in water and sanitation coverage in the near future.

iii) The Ministry's planned projects and programmes have been greatly impacted by COVID- 19 pandemic, through disruption of various activities, reallocation of funds; slow projects implementation.

iv) The increase in water and sanitation coverage is tracked based on the number of people supplied with water from the completed water supplies and sanitation facilities. It is however evident that there are no funds allocated for maintenance of these water supplies and sanitation facilities leading to dilapidated infrastructure unable to serve the expected population.

v) Slow project implementation due to inadequate funds, delayed disbursements, inadequate counterpart funding has negatively impacted on the implementation of some projects.

vi) Land acquisition/ compensation; wayleaves, forest moratorium issues for large infrastructure projects.

vii) Pollution of Water resources: The low sewerage coverage poses a major threat to water quality and public health, largely due to inadequate effluent treatment.

viii) Low Capacity of farmers in irrigation farming and overall governance/management of irrigation schemes.

ix) Land reclamation mandate is not clearly stipulated as a national government or county government function, rendering effective implementation of land reclamation projects and programmes difficult.

x) Land degradation is a very slow process and land owners, policy, legal and political leadership recognize it only at the point of severity.

xi) The cost of land reclamation is very high and yet little funds are allocated nationally and at the county with no external funds support.

xii) Available technologies are not efficient in reverse waste and capacity building is required.

xiii) High energy cost of water production impeding affordability of water.

xiv) Pending appeal at PSC on organization structure- there is need for engaging the PSC for a final outcome on pertinent issues that the Ministry raised on the same.

xv) A lean staff establishment amidst an expanded mandate hence need for top leadership intervention.

xvi) The Ministry faces an aging workforce yet the rate of replacement/appointment is very low leading to a low staff strength that adversely affects service delivery.

xvii) Inadequate training budget which often faces budget cuts thus hindering staff development and subsequent career stagnation. Inclusion of a line item on HR operations would highly enhance execution of critical HR issues.

## 3.3 Emerging Issues

i. Water purification through desalination has become cheaper as a result of advancement of water purification technology.

ii. Introduction of a pro-poor tariff band 1-6m3 on water and sewerage services ensures water and sewerage services are affordable to majority of consumers as charges will be based on the actual consumption.

iii. Rising water levels in the inland lakes due to high sedimentation loads and rainfall as a result of climate change that is causing displacement of persons, destruction of built up infrastructure and livelihoods support systems.

iv. Mapping of degraded lands in the country is necessary for appropriate, efficient and effective county specific land reclamation programs aimed at reversing degradation and achieving land degradation Neutrality (LDN).

v. County- based mapping of irrigation schemes and national assessment of areas under irrigation is necessary for efficient and real time reporting.

vi. Energy efficiency has become a main stream mitigation factor in climate change hence they is need for the sector to create mechanisms for adoption of the technology.

# 4.0 CONCLUSION AND RECOMMENDATIONS

The Ministry of Water, Sanitation and Irrigation has enacted and operationalized the Water Act 2016 and the Irrigation Act 2019 is in place and is being operationalized. The Water Act (Amendment) and KEWI bills have been developed and are in the process of being finalized. Gazettement was done on the following regulations: Water Services, Water Harvesting and Storage, Water Resources and Irrigation (General). Publication of the following strategies were also done during the period under review: the National Irrigation Services Strategy, National Water and Sanitation, National Water Harvesting and Storage and National Water Resources. Draft frameworks for establishment of county irrigation units and irrigation research institutions have been developed. The Ministry has developed procedure and instruments for handing over Water, Sanitation, Irrigation and land reclamation projects.

Proportion of population with access to safe water has increased from 65.5 % in 2021 to 70% in 2022 while urban sewerage coverage has increased from 27.7% to 31% in the same period. The Ministry has also increased area under irrigation by 112,000 acres from 552,000 acres to 664,000 acres in the review period. The projected MTP III targets for water, sewerage and irrigation have not been achieved due to inadequate funding. To fast-track achievement of the above targets, the Ministry has developed the National Water and Sanitation Investment Program (NAWASIP) and is currently developing NAWASIP financing plan in addition, the Irrigation directorate is finalizing on its resource mobilization strategy. The above will inform the Ministry engagement with development partners.

Other recommendations for consideration are: finalization of Water Sector Transfer Plan, need to secure projects sites and wayleaves early in the project cycle to reduce on compensation claims, strengthen collaboration with National treasury, National Land commission and PAPs to ease project implementation.

# ANNEXES

## Annex I: Projects Completed in the Last Ten Years in WWDAs

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| | | ATHI WWDA | | | |
| 1. | Theta Dam Treatment Works and Distribution Water Project | 291,000,000 | Target Population: 60,000 Treatment Capacity: 4,000m3/ day | Mar-14 | Sep-16 |
| 2. | Construction of Kangundo Road , Kibera ,Upperhill and Kirichwa Ndogo Trunk Sewers | 650,000,000 | Target Population:60,000 | Aug-12 | Aug-16 |
| 3. | Gatanga Community water project | 264,000,000 | Target Population: 70,000 Treatment Capacity: 6,000m3/ day | Apr-17 | Jul-17 |
| 4. | Komothai Water Augmentation Project | 300,000,000 | Target Population: 70,000 Treatment Capacity: additional 3,000m3/day | Feb-15 | Jun-17 |
| 5. | Ithanga Water Supply Project | 1,200,000,000 | Target Population: 20,000 Treatment Capacity: 6,000 m3/day | Sep-17 | Dec-19 |
| 6. | Murang'a South Water Supply (Last Mile Connectivity) | 26,853,325 | Target Population: 30,000 | Sep-19 | Jan-21 |
| 7. | 158 Independent Community Based Projects Within Nairobi Metropolitan Area (Emergency Covid-19 boreholes) | 1,620,000,000 | Target Population: 1,250,000 | Jul-20 | Jun-21 |
| 8. | Nairobi Water Distribution Project Lot I (Kiambu town - Roysambu - JKIA Transmission Line) | 2,200,000,000 | Target Population: 336,000 | Jan-17 | Jun-21 |
| 9. | Kigoro Water Treatment Plant Project | 5,230,000,000 | Treatment Capacity 140,000 m3/day | Mar-16 | Nov-20 |
| 10. | Muranga Urban Water Supply (Last Mile Connectivity) | 55,086,206 | Target Population: 32,000 | Sep-19 | Dec-20 |
| 11. | Construction of Oloitoktok Water and Sewerage Project | 887,000,000 | 5,335 connections made | Apr-17 | Sep-21 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 12. | Bulk Water Supply to Nairobi (Northern Collector) – Component I: Construction of Kigoro Water Treatment Plant. | 4,777,000,000 | Target Population: 1,200,000 people (300,000 households) | Mar-16 | Nov-21 |
| 13. | Bulk Water Supply to Nairobi (Northern Collector) – Component IV: Nairobi City Water Distribution Network Modification Project KfW Lot 1(Kiambu Embakasi Transmission line) | 1,486,000,000 | Target Population: 45,000 household connections (180,000 people) | Jun-17 | Nov-21 |
| 14. | Karimenu II Dam Water Supply Project | 23,827,700,000 | Treatment Capacity 73,500 m3/day | May-19 | Jul-22 |
| | | LAKE VICTORIA SOUTH WWDA | | | |
| 15. | Keroka Water Supply Project | 1,890,000,000 | Target Population: 56,000 Treatment Capacity: 3,000 m3/day | Jan-14 | Dec-17 |
| 16. | Rangwe Water Supply Project phase 1 (Kosiga Dam) | 45,000,000 | Target Population: 15,000 | Feb-15 | Aug-16 |
| 17. | Isebania Water Supply Project | 440,000,000 | Target Population: 60,000 | Jan-14 | May-17 |
| 18. | Siaya - Bondo Water and Sanitation Project | 2,200,000,000 | Target Population:200,000 | Nov-12 | Jan-17 |
| 19. | Water Sector Development (Lake Victoria South) (Kericho, Kisii, Nyamira, Litein) | 3,880,000,000 | Target Population: 100,000 Treatment Capacity: 37,000 m3/day | Feb-14 | Jun-21 |
| 20. | Expansion of Water Supply and Sanitation Systems for Kisii and Nyamira (Water Sector Development Programme-C-Lot 1 | 2,289,840,260 | Target Population: 15,600 | Jun-17 | Nov-21 |
| 21. | West Karachuonyo Water Supply Project | 110,072,058 | Target Population: 4700 | Nov-18 | Mar-21 |
| 22. | Migori Water Project | 1,250,000,000 | Target Population: 200,000 | Jan-14 | Jul-14 |
| 23. | Homa Bay Cluster Water Supply and Sanitation Project. | 1,143,100,000 | Target: 1258 connections | Jan-12 | Jul-14 |
| | | CENTRAL RIFT WWDA | | | |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 24. | Lotikip Well Field Development Project | 500,000,000 | Target Population: No estimate yet | Jul-15 | Jun-18 |
| 25. | Iten Tambach Sabor Water Supply Project Phase II | 1,000,000,000 | Target Population: 184,000 | Jun-17 | Jun-18 |
| 26. | Iten Tambach Sabor Water Supply Project Phase I | 1,580,000,000 | Target Population: 64,000; Over 50 km gravity water system, Treatment Capacity: 5,500 m3/day and a water storage tank with 2,000 cubic meters storage capacity. | Oct-14 | Feb-17 |
| 27. | 18 Boreholes under drought mitigation | 30,000,000 | Target population, 100,000 | Mar-16 | Jul-17 |
| 28. | Kapindaram Water Supply Project | 60,000,000 | Target Population: 4,000 | Jul-16 | Jun-17 |
| 29. | Construction of Ellegirini Pipeline and Expansion of Kapsoya Treatment Works | 625,000,000 | Target Population: 24,000 | May-16 | Jan-18 |
| 30. | Pusol Water Project | 40,000,000 | Target Population: 6,000; Treatment Capacity in m3/ day:500 | May-16 | Mar-17 |
| 31. | Kapenguria Water Supply Augmentation | 60,000,000 | Target Population: 25,000; Treatment Capacity: 2,500 m3/day | Jul-16 | Jun-19 |
| 32. | Construction of Kases Dam Water Supply Project (Peace Dam) | 249,754,411 | Target Population: 50,000 | Jul-20 | Jun-21 |
| 33. | Construction of Narok Sewerage and last mile connectivity for Narok | 1,714,225,175 | Target Population: 25,000; Treatment Capacity: 3,000 m3/day | Apr-19 | Jun-21 |
| 34. | Rehabilitation of Leshau – Karago-ini Water Supply Project | 96,800,000 | Target Population: 45,000 | Feb-19 | Sept-20 |
| | | LAKE VICTORIA NORTH WWDA | | | |
| 35. | Construction of Water Supply Project in Chwele Area | 300,000,000 | Target Population: 92,000; Treatment Capacity: 2,000m3/ day | Jun-16 | Feb-18 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 36. | Drilling and equipping of 18No. Boreholes | 30,000,000 | Target population, 100,000 | Mar-16 | Jan-17 |
| 37. | Rehabilitation Sotik - Water Supply System | 32,500,000 | Target population 60,000 | Nov-16 | Aug-17 |
| 38. | Rehabilitation of Litein Water Supply System | 29,700,000 | Target Population: 60,000 | Nov-16 | Aug-17 |
| 39. | Kericho Sewerage Improvement Project | 335,000,000 | Target Population: 80,000 | Dec-13 | Dec-17 |
| 40. | Lake Victoria Water and Sanitation Initiative -Phase II (Kericho, Keroka and Isebania) | 1,506,000,000 | Target population 200,000 | Aug-14 | Dec-20 |
| 41. | Vihiga Cluster Project-Belgium funding | 2,018,000,000 | Target Population: 120,000; Treatment Capacity: 12,500m3/day | Nov-17 | Dec-20 |
| | | COAST WWDA | | | |
| 42. | Construction of Water Supplies in Drought Areas, Lot 3: Construction of elevated steel tanks at existing boreholes | 75,000,000 | Target Population: 75,000 | Jul-14 | Jan-17 |
| 43. | Immediate Baricho Works Expansion & New Pipelines to Kilifi & Gongoni (Lot 3) | 2,314,000,000 | Target Population: 316,700 | Sep-16 | Nov-18 |
| 44. | Nyalani Water Supply Project | 84,000,000 | Target Population: 12,000 | Jan-17 | Apr-17 |
| 45. | Mombasa Network Rehabilitation - Lot 2 | 1,000,000,000 | Target Population: 20,000 | Mar-15 | Aug-17 |
| 46. | Mkanda-Mwabandari rising main | 32,597,212 | Target Population: 3,000 | Oct-16 | Dec-17 |
| 47. | Immediate Baricho Works Electromechanical Works (Lot 1) | 911,000,000 | Target Population: 220,000: Treatment Capacity: additional 22,000m3/day | Jul-16 | May-18 |
| 48. | Extend Services to Informal Settlements - Lot 2 | 121,000,000 | Target Population: 4,500 | Feb-15 | Feb-17 |
| 49. | Malindi Informal Settlement (Lot 2) | 75,000,000 | Target Population: 1,500 | May-15 | May-17 |
| 50. | Drilling and equipping of Three replacement boreholes at Baricho | 415,032,958 | Target Population: 50,000 | May-19 | Apr-21 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 51. | Program for the Improvement of Water Services in Mombasa County – Construction Works for West Mainland Phase I | 404,375,960 | Target Population: 80,000 | Apr-18 | Jan-21 |
| | | NORTHERN WWDA | | | |
| 52. | Expansion of Butiye, Manyatta and Heilu water Supply | 90,000,000 | Target Population: 23,000 people, 48,000 cattle and 120,000 goats | Mar-17 | Mar-18 |
| 53. | Kursin Water Supply | 90,000,000 | Target Population: 4,000 | Nov-17 | May-18 |
| 54. | Wajir -Bor Water Piping & Supply | 95,000,000 | Target Population: 5,000 | Nov-17 | May-18 |
| 55. | Eldas Enole Water Supply | 100,000,000 | Target Population: 50,000 | Sep-16 | Feb-17 |
| 56. | Drilling and equipping of 30 Boreholes | 71,000,000 | Target population: 150,000 | Jan-16 | Jun-17 |
| 57. | Libale Water Pan | 60,000,000 | Target Population:5,000 | Jul-16 | Jan-17 |
| 58. | Rumuruti Water Supply Project | 45,000,000 | Target Population: 40,000 | Dec-15 | Mar-17 |
| 59. | Moyale Water Supply | 50,000,000 | Target Population: 35,000 | Dec-15 | Mar-17 |
| 60. | Isiolo Water and Sanitation Project | 89,000,000 | Target Population: 60,000 | Jul-15 | Jan-17 |
| 61. | Forolle Mega Pan (Peace Dam) | 229,652,630 | Target Population: 10,000 | Mar-20 | Mar-21 |
| 62. | Garissa Sewerage Project | 836,474,387 | Target Population: 12,500 Household connections | Jul-15 | May-21 |
| 63. | Qoloba II Water Pan | 50,000,000 | Target: 5,000 Units of Livestock | May-21 | Nov-21 |
| 64. | Wamba Water Supply Project | 62,063,569 | Target Population: 10,000 | Nov-20 | Jun-21 |
| | | TANA WWDA | | | |
| 65. | Mukurwe-ini water Project | 720,000,000 | Target Population: 10,000 | May-17 | Dec-17 |
| 66. | Kabiru-ini Water Supply | 65,000,000 | Target Population: 3,500 Treatment Capacity: 1,500 m3/day | May-17 | Dec-17 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 67. | Thangatha Dam | 40,000,000 | Target Population: 10,000 | Apr-17 | Jun-19 |
| 68. | Ura Dam 4 | 30,000,000 | Target Population: 9,000 | Apr-17 | Jun-19 |
| 69. | Maua Water Project II and Sewerage/ Drainage Project | 900,000,000 | -* | Apr-17 | Jun-19 |
| 70. | Murang'a Urban Water Supply - Last mile Connectivity | 550,56206.90 | Target Population:5,000 (420 households) | Jun-20 | Jun- 21 |
| 71. | Othaya Sewerage Project (Last Mile Connectivity) | 60,729,700 | Target Population:10,000 | Sept-19 | Jun-21 |
| 72. | Isiolo Town Last mile Sewerage Project | 73,240,000 | Target Population:5,000 (420 households) | Nov-18 | Nov-21 |
| 73. | Murang'a South water supply (Last Mile connectivity) | 26,850,000 | Target Population:5,000 (420 households) | Sept-19 | Nov-21 |
| 74. | Mathira Water Supply Project | 438,000,000 | Target Population:6,000 | Oct-19 | Nov-21 |
| | | TANATHI WWDA | | | |
| 75. | Wote Water Supply & Sanitation Project | 500,000,000 | Target Population: 12,000 | Aug-16 | Sep-18 |
| 76. | Wote Rehabilitation and Expansion of Water Supply Systems | 15,000,000 | Target Population: 2,000 | Aug-16 | Nov-18 |
| 77. | Yatta Canal Rehabilitation | 2,200,000,000 | Target Population: 70,000 and 1,500 Farmers | Aug-14 | Feb-17 |
| 78. | Equipping of Kajiado Boreholes | 72,400,000 | Target Population: 100,000; 10 No. Boreholes with Capacity: 15,000 m3/day | Dec-16 | Jun-17 |
| 79. | Migwani Water Supply Project | 100,000,000 | Target Population: 15,000 | Jul-15 | Mar-17 |
| 80. | Kakuya Water Supply (Kiambere-Mwingi Phase II) | 58,334,892 | Target Population: 75,000 | Mar-20 | Jun-21 |
| 81. | Masinga Cluster Phase II; Kaewa – Kangonde Water Supply Project | 70,786,750 | Target Population: 75,000 | Oct-17 | Jan-21 |
| 82. | Mavoko Drinking Water Supply and Sanitation Project | 2,800,000,000 | Target Population: 1,500,000 | Feb-18 | Jun-21 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 83. | Borehole Equipping and Rehabilitation | 500,000,000 | Target Population: 63,000 | Nov-15 | Nov-20 |
| | NORTH RIFT VALLEY WATER WORKS DEVELOPMENT AGENCY | | | | |
| 84. | Construction of Kases Dam Water Supply Project (Peace Dam) | 249,754,411 | Target Population: 50,000 | Jul-20 | Jun-21 |
| 85. | Chepchor Water Project | 10,000,000 | Target Population 2,000 | July 2021- | March 2022 |
| 86. | Merur Water Project | 10,000,000 | Target Population 2,000 | July 2021- | March 2022 |
| 87. | Rukuini water project | 8,000,000 | Target Population 2,000 | 1st April 2022 | 30th May 2022 |
| 88. | Tulwet water project | 8,000,000 | Target Population 2,000 | 1st April 2022 | 30th May 2022 |
| | Flax Water Project | 8,000,000 | Target Population 2,000 | 1st April 2022 | 30th June 2022 |
| | WATER SECTOR TRUST FUND | | | | |
| 89. | Water Sector Development (Support WSTF) | 1,656,000,000 | Target Population: 250,000 | Dec-14 | Jun-21 |
| 90. | Support to Equitable Access to Quality Water, Basic Sanitation and Enhanced Water Resources Management in Rural Kenya | 2,325,000,000 | Target Population 200,000 | Oct-14 | Jun-21 |
| 91. | The Saudi Programme for Drilling of Wells and Rural Development in Africa | 600,000,000 | Target Population 25,000 | Jul-17 | Jun-20 |
| 92. | OBA Project-I) Embu sewer extension Sub-Project-Embu County | 498,776,582 | Target Population: 25,540 | Jan-18 | Mar-21 |
| 93. | OBA Project-II) Nyeri Sewer Extension Subproject | 266,162,838 | Target Population: 14,815 | Feb-18 | Mar-21 |
| 94. | OBA Project-II) Kisumu water extension Sub-project-Kisumu County | 124,024,462 | Target Population: 7,595 | Aug-17 | Mar-21 |
| 95. | Mathira water extension subproject-Nyeri County | 116,590,487 | Target Population: 7,085 | Mar-19 | Mar-21 |
| 96. | Murang'a South water extension subproject phase 1-Muranga County | 20,715,605 | Target Population: 7,595 | Dec-14 | Nov-20 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 97. | Murang'a South water extension subproject phase II-Murang'a County | 94,919,479 | Target Population: 7,085 | Jan-18 | Mar-21 |
| 98. | Murang'a water extension subproject- Muranga County | 37,400,705 | Target Population: 15,974 | Mar-15 | Mar-21 |
| 99. | Naivasha water extension subproject-Nakuru County | 105,608,896 | Target Population: 15,155 | Feb-18 | Mar-21 |
| 100. | Lanqura Community Water Supply Project- Mandera County | 34,540,000 | Target Population: 3,000 | Feb-19 | Jun-21 |
| 101. | Kathwana Water Supply Project- Tharaka Nithi County | 44,888,393 | Target Population: 5,000 | May-19 | Apr-21 |
| 102. | Sake Community Rural Water Supply Project (WSTF) | 34,540,000 | Target Population: 4,000 | Feb-19 | Jun-21 |
| 103. | Kizingitini Water and Sanitation Project- Lamu County | 40,890,000 | Target Population: 2,520 | Jun-19 | Jun-21 |
| 104. | Nyangoro Maktau Water Project-Taita Taveta County | 88,650,000 | Target Population: 560 Households | Nov-20 | Nov-21 |
| 105. | Baringo Water and Sanitation Project- Lamu County | 69,370,000 | Target Population: 18,475 | Oct-20 | Nov-21 |
| | Irrigation Projects Completed in the Last Five Years | | | | |
| 1. | Kinyako Irrigation Project | 33,000,000 | Area: 160 acres No. of farmers: 120 | 2018 | 2019 |
| 2. | Kaigunji Irrigation Project Phase I | 177,000,000 | 26 km transmission line | 2017 | 2019 |
| 3. | Kaigunji Irrigation Project Phase II Section I | 100,000,000 | Area: 600 acres No. of farmers: 500 | 2019/20 | 2020 |
| 4. | Kanini Irrigation Project | 34,400,000 | Area: 60 acres No. of farmers: 100 | 2020/21 | 2022 |
| 5. | Kaigunji Irrigation Project Phase II Section II | 548,700,00 | Area: 1900 acres No. of farmers: 1000 | 2021/22 | 2022 |
| 6. | Thuci Ridge Irrigation Project | 164,000,000 | Area: 160 acres No. of farmers: 418 | 2015/16 | 2022 |
| 7. | Kingirwa Irrigation project | 144,600,000 | Area: 100 acres No. of farmers: 600 | 2015/16 | 2019 |
| 8. | Wakulima Irrigation project | 31,800,000 | Area: 35 acres No. of farmers: 115 | 2015/16 | 2018 |
| 9. | Koibei Irrigation project | 31,800,000 | Area: 44 acres No. of farmers: 155 | 2015/16 | 2018 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 10. | Muungano Irrigation project | 143,000,000 | Area: 160 acres<br>No. of farmers: 400 | 2015/16 | 2018 |
| 11. | Kamusinga Irrigation project | 70,300,000 | Area: 80 acres<br>No. of farmers: 240 | 2015/16 | 2018 |
| 12. | Chakama Clusters | 15,000,000 | Area:100 acres<br>No. of farmers: 200 | May-2016 | Jun-2017 |
| 13. | Hola expansion | 39,800,000 | Area: 3500 acres<br>No. of farmers: 300 | Jan-2014 | Jul-2020 |
| 14. | Njukini Irrigation project | 66,100,000 | Area:350 acres<br>No. of farmers: 350 | May 2013 | Feb-20 |
| 15. | Njoro Kubwa Canal | 19,200,000 | Area: 3000 acres<br>No. of farmers: 3000 | Apr-19 | Jul-19 |
| 16. | Mansa irrigation project | 29,900,000 | Area:15 green houses<br>No. of farmers: 100 | Jul-2015 | Jul-2020 |
| 17. | Malkadalka irrigation project | 10,300,000 | Area: 200 acres<br>No. of farmers: 200 | Feb-2021 | May-2021 |
| 18. | Mwithaga Irrigation Project | 46,900,000 | Area: 125 acres<br>No. of farmers: 125 | Apr-15 | Apr-16 |
| 19. | Mwithaga Irrigation Project | 15,700,000 | Area:100acres<br>No. of farmers: 500 | May-19 | Dec-19 |
| 20. | Akaiga Irrigation Project | 66,200,000 | Area: 100 acres<br>No. of farmers: 100 | Mar-15 | Sep-19 |
| 21. | Gachoka clusters 2 Irrigation Project | 217,400,000 | Area: 350 acres<br>No. of farmers: 300 | Jun-15 | Jun-19 |
| 22. | Runga Irrigation scheme | 76,200,000 | Area: 500 acres<br>No. of farmers: 500 | Oct-15 | Oct-17 |
| 23. | Lower Kithegi Irrigation Project | 16,900,000 | Area: 100 acres<br>No. of farmers: 95 | May-15 | Jun-20 |
| 24. | Thua Model Farm Irrigation Project | 81,000,000 | Area:11 green houses and 12 acres<br>No. of farmers: 100 | Mar-15 | Sep-19 |
| 25. | Kalundu Irrigation Project (Phase 1 & 2) | 52,900,000 | Area: 100 acres<br>No. of farmers: 80 | Jul-16 | Sep-19 |
| 26. | Muringa Banana Irrigation (Phase I and 2) | 748,700,000 | Area: 3500 acres<br>No. of farmers: 7000 | Sep-11 | Jan-16 |
| 27. | Kondo Irrigation Project ( Phase 1 & 2 ) | 40,500,000 | Area:50 acres<br>No. of farmers: 100 | Feb-13 | Sep-19 |
| 28. | Kwa Majee Irrigation Project (Phase 1 and 2) | 62,100,000 | Area:20 acres<br>No. of farmers:40 | Jan-15 | Sep-17 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 29. | Kako/Kathonzweni Irrigation Project | 45,700,000 | Area: 300 acres No. of farmers: 300 | Apr-15 | Oct-17 |
| 30. | Marngarichi Water Pan | 30,800,000 | Area:10 acres No. of farmers:50 | Jul-15 | Jun-17 |
| 31. | Gatha dam Irrigation Development Project | 109,500,000 | Area:200 acres No. of farmers: 200 | Nov-15 | Mar-18 |
| 32. | Gathanje Irrigation Development Project | 108,900,000 | Area:300 acres No. of farmers: 300 | Dec-15 | Jan-18 |
| 33. | Kwa Njora Phase 1 and 2 Irrigation Projects | 60,400,000 | Area:10 acres No. of farmers: 50 | Sep-15 | Apr-17 |
| 34. | Mutiumwa irrigation project | 34,800,000 | Area:10 acres No. of farmers: 50 | Sep-15 | Oct-16 |
| 35. | Thia Kiruka Irrigation Project | 70,700,000 | Area:500 acres No. of farmers: 300 | Mar-15 | Mar-17 |
| 36. | Riamukurwe Irrigation Project | 75,500,000 | Area:1000 acres No. of farmers: 800 | Jan-14 | Jan-20 |
| 37. | Kamuka Irrigation scheme | 84,300,000 | Area:150 acres No. of farmers: 100 | Feb-14 | Sep-20 |
| 38. | Lokipetot Irrigation Project | 53,200,000 | Area:300 acres No. of farmers: 150 | May-15 | Feb-18 |
| 39. | Turkana irrigation development project ( Naipa Phase 1) | 15,400,000 | Area: 910 acres No. of farmers: 1736 | Mar-20 | Mar-21 |
| 40. | Chesargatat Marich Irrigation Project | 154,800,000 | Area: 600 acres No. of farmers: 300 | Aug-14 | Dec-21 |
| 41. | Kipchukchuk Irrigation Development Project | 82,200,000 | Area:500 acres No. of farmers: 300 | Sep-15 | Sep-17 |
| 42. | Tunyo phase II | 11,200,000 | Area: 1000 acres No. of farmers: 750 | Jul-19 | Mar-20 |
| 43. | Chemase Irrigation development Project Phase 1 | 170,200,000 | Area: 750 acres No. of farmers: 1000 | Apr-15 | Apr-17 |
| 44. | Chemase Irrigation development Project - Phase 2 | 18,500,000 | Area: 100 acres No. of farmers: 100 | Aug-19 | Sep-20 |
| 45. | Eldume phase 1 and 2 Irrigation Project | 83,800,000 | Area: 1000 acres No. of farmers: 650 | Jan-12 | Feb-16 |
| 46. | Kamoskoi Phase 1 Irrigation Project | 104,200,000 | Area: 600 acres No. of farmers: 1000 | Jan-13 | Feb-16 |
| 47. | Mutiriri Irrigation Project (water pan and pipeline) | 95,900,000 | Area: 270 acres No. of farmers:300 | Jun-15 | Jul-17 |

| S/N | Project Name | Cost (KShs) | Population/ Treatment Capacity | Start | Completion |
|---|---|---|---|---|---|
| 48. | Mutaro Irrigation Project | 64,800,000 | Area: 500acres<br>No. of farmers:500 | May-19 | Nov-21 |
| 49. | Soin Irrigation Project (Phase 2) | 93,500,000 | Area: 500 acres<br>No. of farmers:300 | Mar-15 | Mar-16 |
| 50. | Chebara Irrigation Project (Phase 1 and 2) | 70,500,000 | Area: 1200 acres<br>No. of farmers:600 | Jan-13 | Jul-16 |
| 51. | Sare/Gwanga irrigation Project | 16,800,000 | Area:80 acres<br>No. of farmers: 100 | Sep-15 | May-17 |
| 52. | Oldonyiro Irrigation project | 524,000,000 | Area:500 acres<br>No. of farmers: 450 | Jan-13 | Sept-20 |
| 53. | Mweru Umoja Irrigation Project | 151,900,000 | Area:1,000 acres<br>No. of farmers: 1,000 | Jan-19 | Sept-20 |
| 54. | Mweru Umoja (Uruku) Irrigation Project | 19,600,000 | Area:600 acres<br>No. of farmers: 1,200 | May-19 | Nov-20 |
| 55. | Kiirua Buuri Irrigation Project | 284,300,000 | Area:500 acres<br>No. of farmers: 2,000 | Jun-19 | Mar-21 |
| 56. | Muringa Banana Phase 3 Irrigation Project | 481,900,000 | Area:1,453 acres<br>No. of farmers: 2,907 | Nov-17 | Nov-20 |
| 57. | Muringa Banana Phase 4 (Mukami) Irrigation Project | 64,700,000 | Area:350 acres<br>No. of farmers: 500 | Aug-19 | May-21 |
| 58. | Upper Gitwe Irrigation Project | 23,500,000 | Area:250 acres<br>No. of farmers: 285 | Sept-20 | Oct-21 |
| 59. | Nyanjigi Irrigation Project | 96,000,000 | Area:500 acres<br>No. of farmers: 1,000 | Jun-2019 | Jan-22 |
| 60. | Tunyo Phase III Irrigation Project | 19,800,000 | Area:1,000 acres<br>No. of farmers: 750 | May-20 | May-21 |
| 61. | Sandai Irrigation Project | 84,100,000 | Area:1,410 acres<br>No. of farmers: 650 | May-19 | Jun-21 |
| **62.** | **Total** | **5,832,000,000** | | | |

## Annex II: Projects Projected to be completed by 2022

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| ATHI WWDA | | | | | | | | | | |
| 1 | Kiambu | Ruiru and Juja | Ruiru Juja Water Supply Project | 968,000,000 | Target Population: 110,000 Treatment Capacity: 20,000 m3/ day | 01-Nov-10 | 01-Apr-16 | 40,000 | 20,000 | 20,000 |
| 2 | Kiambu | Kikuyu and Kabete | Kikuyu Urban Water Supply Project | 65,000,000 | Target Population: 15,000 Treatment Capacity: 1,500 m3/ day | 01-Aug-14 | 01-Feb-16 | 2,000 | - | - |
| 3 | Muranga | Gatanga | Gatanga Community water project | 264,000,000 | Target Population: 70,000 Treatment Capacity: 6,000m3/day | 14-04-17 | 31-07-17 | 40,000 | 30,000 | - |
| 4 | Nairobi | Westlands, Dagoreti North/ South, Kibra, Langata, Starehe | Gigiri Kabete Water Supply | 800,000,000 | Target Population: 300,000 | 01-Nov-11 | 29-Jan-16 | 100,000 | 50,000 | 50,000 |
| 5 | Kiambu | Kiambu | Kiambu Urban Water Supply Project | 540,000,000 | Target Population: 40,000 Treatment Capacity: 4,000 m3/ day | 01-Aug-14 | 30-Dec-16 | 5,000 | - | - |
| 6 | Muranga | Gatanga | Ithanga Water Supply Project | 1,200,000,000 | Target Population: 20,000 | 01-Sep-17 | 31-Dec-2019 | - | 10,000 | 10,000 |
| 7 | Muranga | Maragwa, Kandara, Kigumo, Gatanga | Muranga South Water Supply (Last Mile Connectivity) | 26,853,325 | Target Population: 30,000 | Sep-19 | Jan-21 | - | - | 10,000 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 8 | Nairobi, Kiambu, Kajiado, Muranga | Various | Independent Community Based Projects Within Nairobi Metropolitan Area (Emergency Covid-19 boreholes) | 1,620,000,000 | Target Population: 1,250,000 | Jul-20 | Jun-21 | - | - | 20,000 |
| 9 | Muranga | Muranga | Muranga Urban Water Supply (Last Mile Connectivity) | 55,086,206 | Target Population: 32,000 | Sep-19 | Dec-20 | - | 10,000 | 15,000 |
| | | | | **5,538,939,531** | | | | **187,000** | **120,000** | **125,000** |
| LAKE VICTORIA SOUTH WWDA | | | | | | | | | | |
| 1 | Sony Sugar | Migori and Uriri | 2 boreholes | 10,000,000 | Target population, 28,000 | 10-Oct-16 | 28-Jun-17 | 15,000 | 13,000 | - |
| 2 | Siaya | Bondo, Gem, Alego Usonga | Siaya - Bondo Water and Sanitation Project | 2,200,000,000 | Target Population:200,000 | 01-Nov-12 | 31-Jan-17 | 50,000 | 50,000 | 20,000 |
| 3 | Kericho, Kisii, Nyamira | Ainamoi/ Bogetutu Chache/ North Mugirango/ Bureti/ Sotik | Water Sector Development (Lake Victoria South) (Kericho, Kisii, Nyamira, Litein) | 3,880,000,000 | Target Population: 100,000 Treatment Capacity: 37,000 m3/ day | Feb-14 | Jun-21 | - | - | 25,000 |
| | | | | **6,090,000,000** | | | | **65,000** | **63,000** | **45,000** |
| RIFT VALLEY WWDA | | | | | | | | | | |
| 1 | Turkana | Turkana West | Lotikip Well Field Development Project | 500,000,000 | Target Population: No estimate yet | 01-Jul-15 | 01-Jun-18 | | 20,000 | |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 2 | Baringo | Baringo North, South and Central | Baringo Rural Water Project | 1,200,000,000 | Target Population: 150,000; No. of Boreholes:70 Boreholes | 01-Jan-14 | 01-May-16 | 80,000 | 40,000 | - |
| 3 | Elgeyo Marakwet | Keiyo North, Keiyo South | Iten Tambach Sabor Water Supply Project Phase II | 1,000,000,000 | Target Population: 184,000 | 01-06-17 | 30-06-18 | 0 | 100,000 | 50,000 |
| 4 | Elgeyo Marakwet | Keiyo North, Keiyo South | Iten Tambach Sabor Water Supply Project Phase I | 1,580,000,000 | Target Population: 64,000; Over 50 km gravity water system, Treatment Capacity: 5,500 m3/day and a water storage tank with 2,000 cubic meters storage capacity. | 01-Oct-14 | 28-Feb-17 | 50,000 | 14,000 | |
| 5 | Elgeyo Marakwet | Marakwet West | Marakwet West/ Kapcherop Phase II Water Supply | 120,000,000 | Target Population: 20,000 Treatment Capacity: 600m3/day | 20-Aug-15 | 30-Dec-16 | 5,000 | - | - |
| 6 | Uasin Gishu | Moiben, Soy, Eldoret North | 18 Boreholes under drought mitigation | 30,000,000 | Target population, 100,000 | 15-Mar-16 | 30-Jul-17 | 80,000 | 20,000 | |
| 7 | Narok | Narok North | Narok Water Supply Project | 1,500,000,000 | Target Population: 50,000; Treatment Capacity: 5,000 m3/ day | 01-Nov-13 | 30-Jun-16 | 5,000 | | |
| 8 | Trans Nzoia | Cherangani | Sengwer Community Water Supply Projects | 36,000,000 | Target Population: 3,000 | 01-Jun-15 | 30-Jun-16 | 500 | | |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 9 | Baringo | Mogotio | Kapindaram Water Supply Project | 60,000,000 | Target Population: 4,000 | 01-Jul-16 | 30-Jun-17 | 4,000 | | |
| 10 | Uasin Gishu | Anaibkoi | Construction of Ellegirini Pipeline and Expansion of Kapsoya Treatment Works | 625,000,000 | Target Population: 24,000 | 30-May-16 | 31-Jan-18 | 10,000 | 14,000 | |
| 11 | West Pokot | Pokot South | Pusol Water Project | 40,000,000 | Target Population: 6,000; Treatment Capacity in m3/day: 500 | 01-May-16 | 31-Mar-17 | 5,000 | 1,000 | |
| 12 | West Pokot | Kapenguria | Kapenguria Water Supply Augmentation | 60,000,000 | Target Population: 25,000; Treatment Capacity: 2,500 m3/day | Jul-16 | Jun-19 | - | 10,000 | 15,000 |
| 13 | West Pokot | Pokot North | Construction of Kases Dam Water Supply Project (Peace Dam) | 249,754,411 | Target Population: 50,000 | Jul-20 | Jun-21 | - | - | 10,000 |
| 14 | Narok | Narok North | Construction of Narok Sewerage and last mile connectivity for Narok | 1,714,225,175 | Target Population: 25,000; Treatment Capacity: 3,000 m3/day | Apr-19 | Jun-21 | - | - | 5,000 |
| 15 | Nyandarua | Ndaragwa | Rehabilitation of Leshau – Karago-ini Water Supply Project | 96,800,000 | Target Population: 45,000 | Feb-19 | Sept-20 | - | 2,000 | 10,000 |
| | | | | **8,811,779,586** | | | | **239,500** | **201,000** | **90,000** |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| LAKE VICTORIA NORTH WWDA | | | | | | | | | | |
| 1 | Bungoma | Mount Elgon and Kabuchai | Construction Water Supply Project in Chwele Area | 300,000,000 | Target Population: 92,000; Treatment Capacity: 2,000m3/day | 20-Jun-16 | 19-Feb-18 | 20,000 | 52,000 | 20,000 |
| 2 | Bungoma | Mount Elgon and Sirisia | Chesikaki - Cheptais - Sirisia Water Supply Augmentation Project | 130,000,000 | Target Population: 15,000; Treatment Capacity: 4,000m3/day | 10-Jul-15 | 30-Dec-16 | 2,000 | - | - |
| 3 | Uasin Gishu | Moiben, Soy, Eldoret North | Drilling and equipping of 18No. Boreholes | 30,000,000 | Target population, 100,000 | 01-Mar-16 | 20-Jan-17 | 40,000 | 20,000 | 20,000 |
| 4 | Bomet | Sotik | Rehabilitation Sotik - Water Supply System | 32,500,000 | Target population 60,000 | 02-Nov-16 | 31-Aug-17 | 40,000 | 20,000 | |
| 5 | Kericho | Belgut and Burret | Rehabilitation of Litein Water Supply System | 29,700,000 | Target Population: 60,000 | 02-Nov-16 | 31-Aug-17 | 40,000 | 20,000 | |
| 6 | Kericho | Ainamoi | Kericho Sewerage Improvement Project | 335,000,000 | Target Population: 80,000 | 01-Dec-13 | 31-Dec-17 | 50,000 | 30,000 | |
| 7 | Kericho | Ainamoi/Bogetutu Chache/Borabu/ Kuria West | Lake Victoria Water and Sanitation Initiative -Phase II (Kericho, Keroka and Isebania) | 1,506,000,000 | Target population 200,000 | Aug-14 | Dec-20 | - | 25,000 | 40,000 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 8 | Vihiga | Emuhaya, Luanda, Sabatia, Hamisi | Vihiga Cluster Project-Belgium funding | 2,018,000,000 | Target Population: 120,000; Treatment Capacity: 12,500m3/ day | Nov-17 | Dec-20 | - | 20,000 | 50,000 |
| | | | | **4,381,200,000** | | | | **192,000** | **187,000** | **130,000** |
| | | | | | COAST WWDA | | | | | |
| 1 | Kwale | Msambweni, Kinango, Marafa, Tana Delta, Taveta, Mwatate | Construction of Water Supplies in Drought Areas, Lot 3: Construction of elevated steel tanks at existing boreholes | 75,000,000 | Target Population: 75,000 | 24-Jul-14 | 20-Jan-17 | 50,000 | 15,000 | |
| 2 | Kwale | Kinango, Kaloleni, Mwatate | Construction of surface modular pressed steel water tanks for CWSB | 0 | Target Population: 200,000 | 06-Jul-05 | 20-Jan-17 | 75,000 | 75,000 | 50,000 |
| 3 | Kilifi | Malindi | Immediate Baricho Works Expansion & New Pipelines to Kilifi & Gongoni (Lot 3) | 2,314,000,000 | Target Population: 316,700 | 12-Sep-16 | 01-Nov-18 | 0 | 200,000 | 100,000 |
| 4 | Taita Taveta | Kinango, Marafa, Wundanyi, Mwatate, Tana South | Construction of Water Supplies in Drought Areas, Lot 1: Equipping of Existing Boreholes for CWSB Region | 58,000,000 | Target Population: 70,000 | 24-07-14 | 20-01-16 | 10,000 | 10,000 | |
| 5 | Taita Taveta | Taveta | Expansion of Taveta Lumi Supply | 84,000,000 | Target Population: 60,000 | 01-01-16 | 31-08-16 | 40,000 | 20,000 | |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 6 | Tana River | Kwale, Kilifi, Lamu, Tana River and Taita Taveta | Installation of plastic tanks, gutters and fittings in CWSB areas | 50,000,000 | Target Population: 225,000 | 01-07-15 | 31-03-17 | 150,000 | 20,000 | |
| 7 | Kwale | Kinango | Nyalani Water Supply Project | 84,000,000 | Target Population: 12,000 | 01-Jan-17 | 27-04-17 | 7,000 | 5,000 | |
| 8 | Kwale | Msambweni, Marafa, Taveta, Mwatate | Construction of Water Supplies in Drought Areas, Lot 2: Development of water sources & equipping with submersible pump sets, solar panels & Gensets | 47,000,000 | Target population, 80,000 | 24-Aug-16 | 30-06-17 | 60,000 | 20,000 | |
| 9 | Mombasa | Kisauni, Bamburi, Nyali, Changamwe and Mvita | Mombasa Network Rehabilitation - Lot 2 | 1,000,000,000 | Target Population: 20,000 | 01-Mar-15 | 30-08-17 | 20,000 | | |
| 10 | Kwale | Lungalunga/ Msambweni | Mkanda-Mwabandari rising main | 32,597,212 | Target Population: 3,000 | 25-Oct-16 | 30-12-17 | 3,000 | | |
| 11 | Kilifi | Malindi | Immediate Baricho Works Electromechanical Works (Lot 1) | 911,000,000 | Target Population: 220,000: Treatment Capacity: additional 22,000m3/day | 01-Jul-16 | 31-05-18 | 120,000 | 100,000 | |
| 12 | Mombasa | Nyali | Extend Services to Informal Settlements - Lot 2 | 121,000,000 | Target Population: 4,500 | 01-Feb-15 | 28-Feb-17 | 500 | | |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 13 | Kwale | Msambweni | Mkanda Dam Rehabilitation Project | 200,000,000 | Target Population: 30,000 | 01-Oct-15 | 31-Aug-16 | 2,000 | | |
| 14 | Taita Taveta | Taveta | Expansion of Taveta Lumi Supply | 84,000,000 | Target Population: 60,000 | 01-Jan-16 | 31-Aug-16 | 5,000 | | |
| 15 | Kilifi | Malindi | Malindi Informal Settlement (Lot 2) | 75,000,000 | Target Population: 1,500 | 01-May-15 | 31-May-17 | 1,500 | | |
| 16 | Kilifi | Malindi | Drilling and equipping of Three replacement boreholes at Baricho | 415,032,958 | Target Population: 50,000 | May-19 | Apr-21 | - | - | 50,000 |
| 17 | Mombasa | Changamwe | Program for the Improvement of Water Services in Mombasa County – Construction Works for West Mainland Phase I | 404,375,960 | Target Population: 80,000 | Apr-18 | Jan-21 | - | - | 40,000 |
| | | | | 5,955,006,130 | | | | 544,000 | 175,000 | 90,000 |
| | | | | | NORTHERN WWDA | | | | | |
| 1 | Garissa | Ijara | Masalani Water & Sanitation Project | 84,000,000 | Target Population: 10,000 | 01-12-15 | 31-12-16 | 0 | | |
| 2 | Turkana | Turkana North and Turkana South | Drilling and equipping of 30 Boreholes | 71,000,000 | Target population: 150,000 | 01-06-16 | 30-06-17 | 100,000 | 50,000 | |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 3 | Marsabit | Moyale | Expansion of Butiye, Manyatta and Heilu water Supply | 90,000,000 | Target Population: 23,000 people, 48,000 cattle and 120,000 goats | 01-03-17 | 01-03-18 | 13,000 | 10,000 | |
| 4 | Wajir | Wajir East | Kursin Water Supply | 90,000,000 | Target Population: 4,000 | 01-11-17 | 31-05-18 | 0 | 4,000 | |
| 5 | Wajir | Wajir South | Wajir - Bor Water Piping & Supply | 95,000,000 | Target Population: 5,000 | 01-11-17 | 31-05-18 | 0 | 5,000 | |
| 6 | Wajir | Eldas | Eldas Enole Water Supply | 100,000,000 | Target Population: 50,000 | 01-Sep-16 | 28-Feb-17 | 20,000 | 10,000 | |
| 7 | Wajir | Wajir South | Habaswein Water Supply (Wajir) | 52,000,000 | Target Population: 25,000 | 01-Feb-15 | 30-Nov-16 | 0 | | |
| 8 | Turkana | Turkana North and Turkana South | Drilling and equipping of 30 Boreholes | 71,000,000 | Target population: 150,000 | 01-Jan-16 | 30-Jun-17 | 100,000 | 50,000 | |
| 9 | Garissa | Fafi | Libale Water Pan | 60,000,000 | Target Population:5,000 | 01-Jul-16 | 31-Jan-17 | 0 | | |
| 10 | Laikipia | Laikipia West | Rumuruti Water Supply Project | 45,000,000 | Target Population: 40,000 | 01-Dec-15 | 31-Mar-17 | 30,000 | | |
| 11 | Marsabit | Moyale | Moyale Water Supply | 50,000,000 | Target Population: 35,000 | 01-Dec-15 | 31-Mar-17 | 25,000 | | |
| 12 | Isiolo | Isiolo North | Isiolo Water and Sanitation Project | 89,000,000 | Target Population: 60,000 | 01-Jul-15 | 31-Oct-16 | 5,000 | | |
| 13 | Marsabit | North Horr | Forolle Mega Pan (Peace Dam) | 229,652,630 | Target Population: 10,000 | Mar-20 | Mar-21 | - | - | 10,000 |
| 14 | Samburu | Samburu East | Wamba Water Supply Project | 62,063,569 | Target Population: 10,000 | Nov-20 | Jun-21 | - | - | 5,000 |
| | | | | **1,188,716,199** | | | | **293,000** | **129,000** | **15,000** |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **2017/18** | 2018/19 | 2019/20 |
| | | | | | TANA WWDA | | | | | |
| 1 | Nyeri | Mukurweini | Mukurwe-ini water Project | 720,000,000 | Target Population: 1,000 | 20-05-17 | 31-12-17 | 1,000 | | |
| 2 | Nyeri | Mathira | Kabiru-ini Water Supply | 65,000,000 | Target Population: 3,500 Treatment Capacity: 1,500 m3/ day | 01-05-17 | 31-12-17 | 3,500 | | |
| 3 | Meru | Tigania East | Thangatha Dam | 40,000,000 | Target Population: 10,000 | 03-Apr-17 | 30-Jun-19 | | 10,000 | |
| 4 | Meru | Igembe Central | Ura Dam 4 | 30,000,000 | Target Population: 9,000 | 03-Apr-17 | 30-Jun-19 | | 9,000 | |
| 5 | Meru | Igembe South | Maua Water Project II and Sewerage/ Drainage Project | 900,000,000 | Target Population:100,000 | 03-Apr-17 | 30-Jun-19 | - | 50,000 | 50,000 |
| 6 | Nyeri | Othaya | Othaya Sewerage Project (Last Mile Connectivity) | 60,729,700 | Target Population:10,000 | Sept-19 | Jun-21 | - | - | 5,000 |
| | | | | **1,815,729,700** | | | | **4,500** | **69,000** | **55,000** |
| | | | | | TANATHI WWDA | | | | | |
| 1 | Makueni | Makueni | Wote Water Supply & Sanitation Project | 500,000,000 | Target Population: 12,000 | 01-08-16 | 30-09-18 | | 10,000 | 2,000 |
| 2 | Makueni | Makueni | Wote Rehabilitation and Expansion of Water Supply Systems | 15,000,000 | Target Population: 2,000 | 01-Aug-16 | 30-11-18 | | 2,000 | 0 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 3 | Kitui | Masinga, Kitui Central, Kitui West and Kitui Rural | Masinga - Kitui Water Supply Project | 2,200,000,000 | Target Population: 180,000 Treatment Capacity: 18,000 m3/ day | 23-Jun-12 | 23-Jun-16 | 60,000 | 20,000 | 10,000 |
| 4 | Machakos | Yatta | Yatta Canal Rehabilitation | 2,200,000,000 | Target Population: 70,000 and 1,500 Farmers | 01-Aug-14 | 28-Feb-17 | 30,000 | 25,000 | 15,000 |
| 5 | National Housing Corporation | Nairobi, machakos and Kisumu | 3 Boreholes | 65,000,000 | Target population, 15,000 | 02-Aug-16 | 30-Jul-17 | 15,000 | 0 | 0 |
| 6 | Kajiado | Kajiado south, Kajiado central, Kajiado north, Kajiado East, | Equipping of Kajiado Boreholes | 72,400,000 | Target Population: 100,000; 10 No. Boreholes with Capacity: 15,000 m3/ day | 01-Dec-16 | 30-Jun-17 | 50,000 | 50,000 | 0 |
| 7 | Kitui | Mwingi central | Migwani Water Supply Project | 100,000,000 | Target Population: 15,000 | 01-Jul-15 | 31-Mar-17 | 15,000 | 0 | 0 |
| 8 | Kitui | Mwingi North | Kakuya Water Supply (Kiambere-Mwingi Phase II) | 58,334,892 | Target Population: 75,000 | Mar-20 | Jun-21 | - | - | 25,000 |
| 9 | Machakos | Yatta | Masinga Cluster Phase II; Kaewa – Kangonde Water Supply Project | 70,786,750 | Target Population: 75,000 | Oct-17 | Jan-21 | - | - | 25,000 |
| 11 | Kajiado, Kitui, Makueni, Machakos | All | Borehole Equipping and Rehabilitation | 500,000,000 | Target Population: 63,000 | Nov-15 | Nov-20 | - | 15,000 | 20,000 |
| | | | | **8,581,521,642** | | | | **170,000** | **122,000** | **97,000** |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| WATER SECTOR TRUST FUND | | | | | | | | | | |
| 1 | Tharaka Nithi<br>Nandi<br>Kisumu<br>Uasin Gishu<br>West Pokot<br>Mombasa<br>Taita Taveta<br>Kilifi<br>Kwale<br>Kakamega<br>Busia | Maara<br>Homa Bay Town<br>Kapenguria<br>Changamwe<br>Mwatate<br>Kilifi North<br>Msambweni<br>Nandi Central<br>Kisumu Central<br>Eldoret North<br>Mumias West | Up-scaling of Basic Sanitation for the Urban Poor (UBSUP) | 1,013 | Target Population: 600,000 | Jul-11 | Dec-21 | 146,000 | 208,000 | 67,000 |
| 2 | Kitui<br>Muranga<br>Kirinyaga<br>Home Bay<br>Nyeri<br>Lamu<br>Vihiga<br>Meru<br>Laikipia<br>Garissa<br>Nakuru<br>Nyandarua<br>Bomet | Kitui Central<br>Maragua<br>Mwea<br>Homa Bay Town<br>Naivasha<br>Ndaragwa<br>Lamu West<br>Bomet Central<br>Mukurweini<br>Imenti South<br>Buuri<br>Nyeri Central<br>Vihiga<br>Laikipia West<br>Ijara | Water Sector Development (Support WSTF) | 1,656 | Target Population: 250,000 | Dec-14 | Jun-21 | 86,000 | 56,000 | 48,000 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 3 | Nakuru<br>Murang'a<br>Kisumu<br>Nyeri<br>Embu | Nyeri Town<br>Embu west<br>Kandara<br>Kisumu East<br>Naivasha<br>Mathira | Kenya Urban Water and Sanitation OutPut Based Aid Project (OBA) | 1,385 | Target Population 120,000 | Dec-14 | Jun-22 | | 47,000 | 34,000 |
| 4 | Laikipia<br>Tharaka Nithi<br>Narok<br>Kwale<br>Nandi<br>Migori | Laikipia East<br>Tharaka<br>Chuka<br>Igambangombe<br>Narok South<br>Suna East<br>Nyatike<br>Suna East<br>Laikipia Esat<br>Mosop<br>Chesumei<br>Tindiret<br>Matuga<br>Kilgoris<br>Narok East<br>Kinango<br>Matuga<br>Chuka<br>Igambangombe<br>Laikipia East<br>Lungalunga<br>Maara | Support to Equitable Access to Quality Water, Basic Sanitation and Enhanced Water Resources Management in Rural Kenya | 2,325 | Target Population 200,000 | Oct-14 | Jun-21 | | 67,000 | 46,000 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2017/18 | 2018/19 | 2019/20 |
| 5 | Garissa<br>Tana River<br>Wajir<br>Turkana<br>Mandera<br>Isiolo<br>Lamu<br>Marsabit | Lamu West<br>Lamu East<br>Bura Tana<br>Isiolo North<br>Isiolo South<br>Ijara<br>Fafi<br>Balambala<br>Garissa Township<br>Galole<br>Garsen<br>Wajir North<br>Wajir South<br>Wajir West<br>Wajir East<br>Turkana East<br>Turkana Central<br>Mandera West<br>Mandera North<br>Laisamis<br>Saku | Green growth and employment creation-Access to and management of of water resources in the Arid and Semi-Arid Lands | 2,222 | Target Population 200,000 | Jul-16 | Jun-22 | | 35,000 | 67,000 |
| 6 | Meru<br>Makueni<br>Kirinyaga<br>Machakos | Kibwezi East<br>Machakos Town<br>Buuri<br>Ndia | Water Supply and Sanitation for the Urban Poor -KfW | 800 | Target Population 150,000 | June 16 | Dec-22 | | | 24,000 |

| S/N | County | Constituency | Project Name | Cost (KShs) | Population | Start | Completion | Additional Population Served | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **2017/18** | 2018/19 | 2019/20 |
| 7 | Baringo<br>Kajiado<br>Kilifi<br>Taita Taveta<br>Mandera<br>West Pokot<br>Samburu<br>Kitui | Kitui East<br>Kitui West<br>Ganze<br>Kajiado East<br>Mwatate<br>Mandera East<br>Pokot South<br>Samburu West<br>Samburu East<br>Baringo South | Ending drought Emergencies Support to drought Risk Management | 2,653 | Target Population 360,000 | Jul-16 | Jun-22 | | | |
| 8 | Wajir<br>Mandera<br>Garissa | To be determined | The Saudi Programme for Drilling of Wells and Rural Development in Africa | 600 | Target Population 25,000 | Jul.-17 | Jun-20 | | | |
| | | | | **12,654** | | | **Totals** | **232,000** | **413,000** | **286,000** |
| | | | | | | | **Grand Totals** | **2,040,000** | **1,549,000** | **1,058,000** |

## Annex III: Irrigation Projects expected to be Completed by 2022

| S/N | County | Constituency | Project Name | Cost (KShs Mill) | Area and beneficiaries | Start Date | Completion Date |
|---|---|---|---|---|---|---|---|
| 1 | Nyeri | Tetu | Kaigunji Phase ii (B) Irrigation project | 548.7 | Area: 1900 acres<br>No. of farmers: 1000 | 2020/21 | 2021/2022 |
| 2 | Tharaka Nithi | Chuka Igamba Ng'ombe | Thuchi Ridge | 164 | Area: 160 acres<br>No. of farmers: 418 | 2015/16 | 2021/22 |
| 3 | Kirinyaga | Kirinyaga Central | Kinyako Irrigation Project | 33 | Area: 60 acres<br>No. of farmers: 100 | 2019 | 2022 |
| 4 | Tharaka Nithi | Maara | Kanini irrigation project | 34.4 | Area: 60 acres<br>No. of farmers: 100 | 2020/21 | 2021/22 |
| 5 | Muranga | Kiharu | Muranga Cluster Lot 1 | 132 | Area: 130 acres<br>No. of farmers: 150 | 2020/21 | 2021/22 |
| 6 | Muranga | Kangema, Gatanga and Kandara | Muranga Cluster Lot 3 | 218.7 | Area: 200 acres<br>No. of farmers: 300 | 2020/21 | 2021/22 |
| 7 | Embu | Gaturi | New Kithimu Irrigation project | 285 | Area: 600 acres<br>No. of farmers: 1230 | Oct-2020 | 2021/22 |
| 8 | Embu | Embu West | Itabua Muthatari irrigation project | 218 | Area: 765 acres<br>No. of farmers: 1530 | Oct-2020 | 2021/22 |
| 9 | Embu | Mbeere South | Kiamuringa irrigation project | 216 | Area: 600 acres<br>No. of farmers: 1200 | Oct-2020 | 2021/22 |
| 10 | Embu | Mbeere North | Kanyuambora Irrigation project | 220 | Area: 625 acres<br>No. of farmers: 1250 | Oct-2020 | 2021/22 |
| 11 | Embu | Runyenjes | Iriari irrigation project | 95 | Area: 330 acres<br>No. of farmers: 1230 | Oct-2020 | 2021/22 |
| 12 | Meru | | Meru Clusters irrigation project | 258.3 | Area: 800 acres<br>No. of farmers: 1000 | 2020/21 | 2021/22 |

| S/N | County | Constituency | Project Name | Cost (KShs Mill) | Area and beneficiaries | Start Date | Completion Date |
|---|---|---|---|---|---|---|---|
| 13 | Tharaka Nithi | | Tharaka Nithi Clusters 2 irrigation project | 353.8 | Area: 1200 acres<br>No. of farmers: | 2020/21 | 2021/22 |
| 14 | Muranga | Maragua Sub-County | Area: 675 acres<br>No. of farmers: 1350 | 217.4 | No. of farmers: 1350 | Jun-2020 | 2021/22 |
| 15 | Muranga | Mathioya | Mukurwe Wa Nyagathanga irrigation project | 263.3 | Area: 585 acres<br>No. of farmers: 1170 | May-2020 | 2021/22 |
| 16 | Muranga | Muranga-East | Mirira irrigation project | 544.4 | Area: 675 acres<br>No. of farmers: 2300 | Aug-2020 | 2021/22 |
| 17 | Muranga | Mathioya | Gikindu irrigation project | 131.9 | Area: 250 acres<br>No. of farmers: 300 | Sep-2020 | 2021/22 |
| 18 | Muranga | Kahuro | Kiamboka irrigation project | | Area: 100 acres<br>No. of farmers: 300 | Sep-2020 | 2021/22 |
| 19 | Muranga | Kahuro | Gakaki irrigation project | | Area: 163 acres<br>No. of farmers: 120 | Sep-2020 | 2021/22 |
| 20 | Muranga | Kahuro | Kahithe Gitiri irrigation project | | Area: 288 acres<br>No. of farmers: 100 | Sep-2020 | 2021/22 |
| 21 | Muranga | Kandara | Boboti Kiamande irrigation project | 113.9 | Area: 550 acres<br>No. of farmers: 2000 | Sep-2020 | 2021/22 |
| 22 | Muranga | Kigumo | Thangaini irrigation project | | Area: 100 acres<br>No. of farmers: 200 | Sep-2020 | 2021/22 |
| 23 | Muranga | Kandara | Ndakaini Wanduhi irrigation project | | Area: 100 acres<br>No. of farmers: 120 | Sep-2020 | 2021/22 |
| 24 | Muranga | Kigumo | Kieni Gathugu Irrigation Project | 15.9 | Area: 150 acres<br>No. of farmers: 200 | Sep-2020 | 2021/22 |

| S/N | County | Constituency | Project Name | Cost (KShs Mill) | Area and beneficiaries | Start Date | Completion Date |
|---|---|---|---|---|---|---|---|
| 25 | Laikipia | Laikipia East | Nyamuguna irrigation project | 182.5 | Area: 375 acres<br>No. of farmer: 500 | May-2019 | 2021/22 |
| 26 | Nyeri | Mathira | Kaguyu Kienjaini irrigation project | 52.7 | Area: 200 acres<br>No. of farmers: 800 | Jan-2020 | 2021/22 |
| 27 | Nyeri | Othaya | Changachicha irrigation project | 151.4 | Area: 400 acres<br>No. of farmers: 400 | Feb-2021 | 2021/22 |
| 28 | Nyandarua | Ol Kalou | Mumbi Dam | 33.1 | Area: 225 acres<br>No. of farmers: 670 | Sep-2020 | 2021/22 |
| 29 | Nyandarua | Ol Kalou | Gwa Kiongo water pan | 56.7 | Area: 600 acres<br>No. of farmers: 100 | Sep-2020 | 2021/22 |
| 30 | Nyandarua | Kinangop | Upper Gitwe | 21.1 | Area: 225 acres<br>No. of farmers: 285 | Sep-2020 | 2021/22 |
| 31 | Turkana | Loima | Naipa Lot 2 | 70 | Area: 120 acres<br>No. of farmers: 500 | Jan-2020 | 2021/22 |
| 32 | Turkana | Turkana West | Lotikipi (Nanam) | 64.3 | Area: 20 acres<br>No. of farmers: 80 | Mar-2020 | 2021/22 |
| 33 | Makueni | Kibwezi East | Yikitaa Irrigation Project | 219.9 | Area: 300 acres<br>No. of farmers: 300 | Aug-2017 | 2021/22 |
| | **Total** | | | **4915.4** | | | |

## Annex IV: Details of Dams

| S/N | Name of Dam | County | Capacity (million m3) | Beneficiaries (persons) | Approx. Cost (KSh million) | Contracting Authority | Project Status/Challenges |
|---|---|---|---|---|---|---|---|
| Design, Build and Finance Dams | | | | | | | |
| Under Construction Phase | | | | | | | |
| 1 | Itare Dam | Nakuru | 28 | 800,000 | 29,000 | RVWSB | Construction Works at 27.7%. Project Contractor faced financial challenges with head office in Italy. The contractor temporarily stopped work since October 2018. The Ministry of Water, Sanitation and Irrigation and National Treasury are working out modalities for resumptions of works. |
| 2 | Bonyunyu Dam | Nyamira | 40 | 450,000 | 14,200 | LVSWSB | Construction Works at 10% |
| 3 | Thwake Dam | Makueni | 681 | 1,300,000 | 42,000 | MoWS | Construction works started in March, 2018 and the project is at 72%. |
| 4 | Siyoi/Muruny | West-Pokot | 9.9 | 200,000 | 10,000 | NWHSA | Physical project progress at 65%<br>Requires funds to avoid slow progress Rate, Suspension & Pendings Bills. Both LOT 1 & 2 |
| 5 | Mwache Dam | Kwale | 118 | 2,000,000 | 15,000 | MoWS | Commencement for the Dam works was 4th March 2022 |
| 6 | Badasa | Marsabit | 5 | 100,000 | 4,200 | NWSHA | Stalled due to Court Case which has been resolved.<br>Design Review & ESIA Complete<br>Awaiting funding for implementation |
| 7 | Umaa Dam | Kitui | 0.9 | 75,000 | 2,000 | NWHSA | Stalled due to Court Case which has been resolved.<br>Design Review & ESIA Complete<br>Awaiting funding for implementation |
| 8 | Ruiru II Dam/Water Supply | Kiambu | 13.5 | 800,000 | 25,200 | AWSB | Geotechnical investigations have done for Detailed Design. Contract Awarded. Resettlement of Project Affected Persons on Key Dam priority Areas ongoing. |
| | | | **896** | **5,725,000** | **141,600** | | |

| S/N | Name of Dam | County | Capacity (million m3) | Beneficiaries (persons) | Approx. Cost (KSh million) | Contracting Authority | Project Status/Challenges |
|---|---|---|---|---|---|---|---|
| Design, Build and Finance Dams | | | | | | | |
| | | | | Under Design Phase | | | |
| 9 | Maragua IV Dam and Water Supply | Muranga | 225 | 1,500,000 | 35,600 | TWWDA | EPC&F advertised and is being evaluated by the implementing agency. |
| | | | **225** | **1,500,000** | **35,600** | | |
| | | | | Under Procurement Stage | | | |
| 10 | Kamumu Dam | Embu | 22 | 100,000 | 20,423 | TWWDA | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment. |
| 11 | Rupingazi Dam | Embu | 28 | 120,000 | 23,009 | TWWDA | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment. |
| 12 | Thambana Dam | Embu | 12 | 100,000 | 19,097 | TWWDA | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment. |
| 13 | Kithino Dam | Meru | 103 | 205,000 | 10,200 | TWWDA | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.<br>National Treasury awaits the Creditor to provide a draft Loan Agreement complete with loan terms to enable concessionally analysis. |
| 14 | Maara Dam | Tharaka-Nithi | 15 | 80,000 | 6,210 | TWWDA | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment. |

| S/N | Name of Dam | County | Capacity (million m3) | Beneficiaries (persons) | Approx. Cost (KSh million) | Contracting Authority | Project Status/Challenges |
|---|---|---|---|---|---|---|---|
| Design, Build and Finance Dams | | | | | | | |
| 15 | Thingithu Dam | Meru | 3.4 | 210,000 | 600 | TWSB | RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment. |
| 16 | Kahurura Dam | Laikipia | 2 | 217,000 | 3,000 | NWSB | The project is being procured under PPP model. Project at initial stages of design and procurement. Implementing Agency requested to submit mandatory financing requirements |
| 17 | Pesi Dam | Nyandarua | 16 | 80,000 | 3,000 | NWHSA | EOI completed for Financing, design and Construction. |
| 18 | Kinja Dam | Nyandarua | 1.6 | 158,000 | 2,000 | NWHSA | EOI completed for Financing, design and Construction. |
| 19 | Wiyumiririe Dam | Laikipia | 1.5 | 50,000 | 3,000 | NWHSA | EOI completed for Financing, design and Construction. |
| 20 | Karemeno Dam | Nyeri | 12.3 | 1,375 | 8,000 | AWSB | Preliminary Design |
| 21 | Londiani | Kericho | 55 | 450,000 | 4,685 | NWHSA | At detailed design. NWHSA requires a total of Ksh. 60.8Million to pay the consultant to complete project studies/ documentation. Awaiting funding for implementation. |
| 22 | Bute Dam | Wajir | 21 | 77,000 | 7,000 | NWSB | Tender financing agreement, Commercial Contract Signed |
| 23 | Bosto Dam | Bomet | 70 | 800,000 | 19,900 | NWHSA | Commercial and Financing Agreement Signed. Contractor to mobilize once access to site is granted. Negotiation with KFS on variation of the moratorium. |
| 24 | Gatei dam | Kiambu | 16 | | 15 | AWSB | Evaluation of Expression of Interest finalized. RFP to be issued |
| 25 | Keben/Lessos Dam | Nandi | 5.4 | 3,750 | 4,200 | LVNWSB | Commercial contract signed seeking clearance from The National Treasury subject to availability of land, due diligence and Environmental Impact assessment |
| 26 | Isiolo Dam/Crocodile Jaw | Laikipia | 215 | 134,000 | 22,700 | NWHSA | Project Designs are Complete. Awaiting funds for clearing of Pending Bills and Implementation |

| S/N | Name of Dam | County | Capacity (million m3) | Beneficiaries (persons) | Approx. Cost (KSh million) | Contracting Authority | Project Status/Challenges |
|---|---|---|---|---|---|---|---|
| Design, Build and Finance Dams | | | | | | | |
| 27 | Ndarugo I dam | Kiambu | 225 | 1,000,000 | 35,600 | AWSB | Commercial contract under evaluation by AG and National Treasury. Programme under PPP. |
| 28 | Kiandongoro/Chania Dam | Nyeri | 24 | 20,000 | 12,000 | TWSB | Feasibility Study |
| | **Sub- Total** | | **848** | **3,806,125** | **191,439** | | |
| Completed | | | | | | | |
| 29 | Karimenu II Dam | Kiambu | 19 | 580,000 | 27,150 | AWSB | Completed in 2022 |
| 30 | Yamo Dam | Samburu | 6 | 12,000 | 2,106 | NWSB | Completed in 2022 |
| 31 | Chemususu Dam | Baringo | 35 | 300,000 | 4,800 | RVWSB | Completed in 2011 |
| 32 | Theta | Kiambu | 0.4 | 50,000 | 741 | AWSB | Completed in 2015 |
| 33 | Kiserian Dam | Kajiado | 1.8 | 253,000 | 1,000 | NWHSA | Completed in 2013 |
| 34 | Maruba dam | Machakos | 0.6 | 200,000 | 500 | NWHSA | Completed in 2010 |
| 35 | Thangatha Dam | Meru | 0.25 | 165,000 | 100 | TWSB | Completed in 2020 |
| 36 | Ura Dam | Meru | 0.1 | 50,000 | 100 | TWSB | Completed in 2020 |
| 37 | Kianjuri Dam | Meru | 0.25 | 90,000 | 90 | TWSB | Completed in 2020 |
| 38 | Wamba Dam | Samburu | 0.15 | 3,100 | 106 | NWSB | Completed in 2021 |
| | **Sub- Total** | | **63.55** | **1,703,100** | **36,693** | | |
| Under Planning and Design | | | | | | | |
| 39 | Malewa Dam | Nyandarua | | 2,500 | 20,000 | MoWSI | Feasibility to be completed by April, 2019 |
| 40 | Irati Dam | Muranga | | 5,000 | | AWSB | Pre-Feasibility completed. |
| 41 | Dam 42A | Busia | 170 | | 15,000 | LVNWSB | Detailed design |
| 42 | Dam 40A | Kakamega | 100 | | 4,000 | LVNWSB | Preliminary Design |

| S/N | Name of Dam | County | Capacity (million m3) | Beneficiaries (persons) | Approx. Cost (KSh million) | Contracting Authority | Project Status/Challenges |
|---|---|---|---|---|---|---|---|
| Design, Build and Finance Dams | | | | | | | |
| 43 | Dam 33B | Bungoma | 100 | | 5,000 | LVNWSB | Preliminary Design |
| 44 | Malakisi Dam | Bungoma | 36.3 | 23,500 | 8,000 | LVNWSB | Feasibility Study |
| 45 | Tisi Dam | Bungoma | 21 | | 6,000 | LVNWSB | Feasibility Study |
| 46 | Soin/Koru Dam | Kericho/ Kisumu | 86.6 | 1,710,000 | 19,200 | NWHSA | Awarded but awaiting Cabinet Approval before signing of the Contract Agreement. |
| 47 | Rare Dam | Kilifi | 80 | 500,000 | 29,000 | NWHSA | Detailed Design completed. |
| 48 | Two Rivers Dam | Uasin Gishu | 12.8 | 400,000 | 4,000 | LVNWSB | Pre-Feasibility completed. |
| 49 | Beregei Dam | Baringo | 20 | | 2,300 | RVWSB | Feasibility Study |
| 50 | Nyangores Dam | Bomet | | 1,000 | | RVWSB | Feasibility Study |
| 51 | Bisanadi Dam | Isiolo | 0.04 | 2,150 | | NWSB | Interim Study |
| 52 | Kathita II Dam | Meru | 0.25 | 15,000 | 0.75 | TWSB | Desk Study and Site identification completed. Granting of Authority by Kenya Forest Service to access Mt.Kenya Forest Reserve to conduct detailed topographical survey is ongoing |
| 53 | Kathita Mega | Meru | 7 | | | TWSB | Preliminary Design |

## Annex V: Projects under the Big 'Four" Agenda

### Key ongoing water and sewerage projects to support Manufacturing pillar

| S/ No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 1. | Naivasha Industrial Park Water Supply | Naivasha | 1,200 | - | Drilling and equipping boreholes to supply 9,000m3/day of water to the park and development of a sewerage system to treat effluent from the Industrial Park and adjacent developments. The long-term water supply will be supplied by Aberdare Bulk Water Project. | Project is completed and commissioned |
| 2. | Dongo Kundu Water Supply | Mombasa SEZ | 500 | - | 3No. Boreholes were drilled with a yield of 2,500m3/day. The project involves extension of pipeline to supply 1,000m3/ day of water as a short-term measure to the Dongo Kundu SEZ in Mombasa. The long-term water supply will be supplied using Mwache Dam | Pipeline extension from the line from Tiwi Boreholes to the SEZ as a short-term plan. Both Phase I is complete and Phase II are at 100% ready for commissioning |
| 3. | Water Supply to Kenanie Leather Industrial Park | Athi River | 300 | 150 | To ensure the Kenanie Leather Industrial Park facilities are connected to reliable water supply to enable its development and running | Project is at 5% complete. Proposed to get water from Mavoko Water Supply system |
| 4. | Supply water to Constituency Industrial Development Centres -ESP | 44 Counties | 44 | 44 | Connect water supply to 88 Constituency Industrial Development facilities distributed across the country | Proposed to be connected to the existing water supplies managed by the Water Service Providers. No progress to date |

| S/ No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 5. | Immediate Water Supply Konza Technopolis Complex | Konza City | 70 | 70 | 5 No. boreholes have been drilled and equipped to supply 1,000m3/day. Extension of Pipeline from Nol Turesh Water Supply serve the Konza City facilities will provide an additional 2,000m3/day as a short-term water supply to enable development and running of the city. Medium term (10,000m3/day) and Long-term water supply of 30,000m3/day will be from Thwake Dam. | Currently being serviced by 7 No. strategic boreholes with a yield of 1,000m3/day. Project is ready for tendering. |
| 6. | Naivasha Industrial Park Sewerage Project | Naivasha | 2,000 | 0 | Proposed Sewerage Project is expected to serve the Industrial Park that is under development and the adjacent developments. | At Conception Stage, project site being identified. Project is GoK funded. Funding is yet to be allocated. |
| | Total | | 4,114 | 264 | | |

## Key projects to support Food and Nutrition Security

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 1. | Development of Blue Economy Initiatives - Connection of potable water to fish landing sites at the Coast | Mombasa | 165 | 85 | Connection of fish landing site facilities at Kichwa Cha Kati, Gazi, Vanga, Ngomeni, Kibuyuni with reliable water supply | Proposed to get water by pipeline extension from the Baricho Works Pipeline. Funding removed during supplementary |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 2. | Connection of potable water to two fish markets at the Coast at Malindi and Likoni | Malindi and Likoni | 30 | 0 | Connection of two fish market facilities at Malindi and Likoni with reliable water supply | Proposed to get water by pipeline extension from the Malindi and Likoni water supplies. Funding removed during supplementary |
| 3. | Supply of water to livestock holding grounds | 13 Counties | 300 | 150 | Drilling and equipping of boreholes to supply 15 livestock holding grounds facilities with reliable water supply | Proposed to drill and equip boreholes, and construct water tanks for each of the sites. Funding removed during supplementary |
| 4. | Small Holder Irrigation Programme | Embu, Kirinyaga and Tharaka Nithi | 630 | 199 | The project aims to construct 6 schemes namely: - Gatene (Embu); Miuka and Kandeki (Kirinyaga); Mutino, Magati and Kiramanti (Tharaka Nithi); On completion 1,570 acres would be put under irrigation to benefit 1,800 farmers. | 19 irrigation schemes covering 5,460 acres and benefiting 6,088 farmers completed for phases 1-3 at a cost of Kshs 1.427 Billion. In the current phase 4, detail designs for six proposed schemes have been completed, awaiting to advertise for construction works expected to increase area under irrigation by 1,520 acres |
| 5. | Bura Irrigation Scheme | Tana River | 7,356 | 1,550 | The Project aims at installation of gravity water abstraction system to lower the cost of production and increase the area under irrigation in Bura to 15,000 acres from the current 6,000 acres. | Started in 2013 to be completed in 2023<br>The construction works has since been phased; phase 1 which deals with the intake works is currently at 76.47% and phase 2 which handles the main gravity canal is 35% complete. Excavation of 26km new canal completed; construction of canal structures including piling is ongoing; Rehabilitation of infrastructure for 5000 acres complete and under production. 61% progress. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 6. | Community Based Irrigation Projects | Countrywide | 9,280 | 712 | To construct/ rehabilitate community-based smallholder irrigation projects which will put 30,000 acres under irrigation and benefit 32,000 farmers. The project will involve construction of intake structures, main canals and infield structures in the various schemes that are yet to be completed. | Construction of 1900 acres Kaigunji Irrigation Project Phase II Section II- is complete, Murang'a cluster is 80-90% complete and 100 acres Kanini irrigation project completed. Total of 15 projects covering 7,050 acres have been completed under the program. |
| 7. | Galana Kulalu Food Security Project | Kilifi and Tana River Counties | 8,681 | 10 | The aim of the project is to develop 10,000 acres model farm project consisting of centre pivot and drip irrigation system as a pilot. Expansion of the project to 400,000 acres ultimately under PPP to explore the potential of irrigation in the area will be undertaken in future phases | 5,100 acres are complete and under production by NIA. To achieve the remaining 4,900 acres, 17 No. Centre Pivots have been installed (out of 25) and tested. Equally, the main conveyance and Distribution Pipeline of 23.3 Km has been completed out of 36km and the pump house is under construction. Works are 95% complete. |
| 8. | National Expanded Irrigation Programme | Countrywide | 123,930 | 3,105 | Provision of irrigation infrastructure for abstraction, conveyance, distribution and application of irrigation water for 572 identified irrigation projects across the country | Constructed over 240 irrigation projects across 47 counties with cumulative total area of 230,866 acres, directly benefiting 267,426 farmers. Rehabilitation and expansion of public schemes by additional 21,000 acres. |
| 9. | Mwea Irrigation Development Project (Thiba Dam and Irrigation Area) | Kirinyaga County | 19,967 | 3,301 | The project aims to increase water storage by 15.4 million M3 by construction of Thiba dam to facilitate double cropping in Mwea Scheme from 19,500 acres to 50,000 acres and expansion of the scheme by 10,000 acres. 20,000 people are expected to benefit | The dam is 100% complete and 8.8 million cubic meters of water has been impounded. The scheme has expanded by 6000 acres under out growers to 26,000 acres under paddy. The gates have been opened to release water downstream to the farm land for rice production. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 10. | Rwabura Irrigation Development Project | Kiambu County | 935 | 706 | The project aims as providing irrigation infrastructure for 1500 acres that will support production of horticultural crops and fruits valued at Kshs 390 million by 2022. | The two intakes one on R. Rwabura and the other on R. Thiririka are at 90% completion, laying of conveyance pipeline is ongoing where 12km out of 19km is done, 48% of pipes for mainlines and submains have been delivered and installation will commence once the accessories are delivered from Spain. The project is 40% complete. |
| 11. | Turkana Irrigation Development Project | Turkana County | 9,197 | 300 | The project aims at construction of intake, conveyance canals for 5000 acres in Naipa, expansion of Katilu clusters by 4000 acres, groundwater for irrigation targeting 3000 acres. These and others are expected to increase the area under irrigation in Turkana from the current 22,000 acres to 53,000 acres within five years. | Completed rehabilitation of 20 projects covering 19,000 acres to benefit 9,080 households and provide a stable supply of maize at an average of 38,000 tons of maize and millet. |
| 12. | Lower Kuja Irrigation Scheme | Migori County | 4,694 | 200 | Construction of intake, canal network and water control structures for 19,290 acres to benefit 3,000 farmers directly. | Ongoing construction in phases where 4,000 acres has been achieved and production is ongoing. |
| 13. | Lower Sabor Irrigation Project | Uasin Gishu County | 400 | 15 | Supply, laying of pipelines. Supply, and installation of drip kits and in-field sprinkler irrigation systems for 2000 acres to benefit 4,500 people directly and indirectly | Construction of on-farm infrastructure is complete and construction is going on. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 14. | Land Reclamation (Land Degradation Assessment Program) | Countrywide in 15 proposed sub-basins/ sub-catchments | 394 | 6 | The programme involves increasing water storage capacity by 4.4 billion cubic metres through enhancing reliable and adequate water harvesting and storage to meet domestic, irrigation and industrial water needs as well as environmental storage through the construction of medium size and multipurpose dams.<br>Supported Land Degradation Assessment (LADA) Program at watershed level to develop recommendations to halt and reverse degradation and provide solutions for reclamation. | The programme involves increasing water storage capacity by 4.4 billion cubic metres through enhancing reliable and adequate water harvesting and storage to meet domestic, irrigation and industrial water needs as well as environmental storage through the construction of medium size and multipurpose dams.<br>3 water basin based land degradation assessment conducted for Lake Magadi, Upper Kerio Valley and Upper Ewaso Nyiro North basins.<br>15,600 ha of land reclaimed into productive lands in Turkana, Garissa, West Pokot, Baringo, Laikipia, Isiolo, Tana River, Kwale, TaitaTaveta, Kajiado, Narok and Busia Counties. |
| 15. | National Water Harvesting and Groundwater Exploitation | Countrywide | 11,000 | 500 | The project involves construction of water pans and small dams ranging from 10,000m3 – 50,000m3 by 2021 to harvest and store about 18 million m3 of water from the surface run-off. This will enable about 180,000 Hectares to be reclaimed to be put under production. | Projects initiated in 2014. To date, 941 water pans/small dams constructed harvesting over 14.3 million $m^3$ of water; Implementation of 5 water pans and 13 boreholes ongoing |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2021/22 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 16. | Micro Irrigation Programme for Schools | Countrywide | 2,030 | 65 | The project involves constructing micro irrigation facilities in 2000 schools. This will enable about 2,000 acres in schools to be put under production. Drill boreholes to benefit 2000 schools with water across the country annually. | Projects initiated in 2016. 89 boreholes have since been drilled & equipped and 63 pilot greenhouses constructed in 120 public schools for horticultural and fruit/tree seedlings production. |
| 18. | Spate Irrigation for Climate Resilience in Samburu, Marsabit and Isiolo | Samburu, Marsabit and Isiolo | 6,930 | 150 | To improve climate resilience in Samburu, Marsabit and Isiolo counties through irrigation | Constructed and rehabilitated water infrastructure with a potential volume of 1,113,000m3 of water for crop production and livestock use. |
| 19. | Water Security and Climate Adaptation in Mandera and Wajir clusters | Mandera and Wajir | 4,200 | 150 | To improve climate adaptation in Mandera and Wajir clusters | Constructed and rehabilitated water infrastructure with a potential volume of 699,000m3 of water for crop production and livestock use. |
| 20. | Rehabilitation of Strategic Water Facilities- NIA | Countrywide | 9,768 | 860 | To restore and increase access to water by 7.2MCM for communities that depend on existing colonial water pans and small dams through rehabilitation and expansion to meet their water needs. | 42 ongoing contracts at 93% completion to provide approximately 4.2 million cubic meters of water for crop production, human and livestock use. |
| | Total | | | | | |

## Water Projects Supporting Affordable Housing

| S/ No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 1. | Water & Sewer Reticulation for Park Road, Starehe & Shauri Moyo Housing Projects | Nairobi | 3,307 | 300 | Development of 40km reticulation water pipelines; Development of 15km sewers and sewer outfall; Development of water storage tanks capacity 12,500m³ | Proposed to get water from Nairobi City Water Supply system. Project Completion at 60% |
| 2. | Water & Sewer Reticulation - Combined Ruai (Utawala, Mihango,Ruai and Githunguri) | Nairobi | 6,400 | 300 | Activated Sludge Conventional Sewage Treatment Plant, capacity 70,000m³/day including wastewater reuse technology; Development of 12km water pipeline; Development of 8km sewers and sewer outfall; Development of water storage tanks, capacity 5,000m³ | Proposed to get water from Nairobi City Water Supply system |
| 3. | Mavoko Drinking water supply Project | Mavoko | 2,800 | 125 | Construction of intake and treatment works of 30,000m3/day; Distribution pipeline of over 150km and water tanks; Rehabilitation and augmentation of Mavoko, Athi River and Mlolongo towns sewerage system | Project Completed and commissioned 2022 |
| 4. | Mavoko Water & Sewerage Interventions - Extension of Pipeline | Mavoko | 585 | 125 | Development of 15km water pipeline; Drilling & Equipping of 5no. Boreholes to cater for construction works; Development of 15km sewers and sewer outfall; Development of 2,000m3 water storage tank and 250m3 steel elevated tank; Development of sewerage pre-treatment facility (DTF); Development of 1.5km sewer for NHC housing | Independent water supply from boreholes |

| S/ No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 5. | Water & Sewer Reticulation - Kibera B Housing Project | Nairobi | 450 | 125 | Pipeline extension to Kibera B Housing Projects facilities | Proposed to get water from Nairobi City Water Supply system |
| 6. | Water & Sewer Reticulation - Mariguini Housing Project | Nairobi | 370 | 125 | Pipeline extension to Mariguini Housing Projects facilities | Proposed to get water from Nairobi City Water Supply system |
| 7. | Water & Sewer Reticulation - East Africa Portland Housing Project | Athi River | 1,400 | 125 | Development of 25km water pipeline; Development of 30km sewers and sewer outfall; Development of 5,000m³ water storage tank and 350m³ of steel elevated tank; Development of sewerage pre-treatment facility (DTF) Prioritization of Mavoko Dam Water Supply Project under Belgian Funding | Proposed to get water from Mavoko Water Supply system |
| | Total | | 15,312 | 1,194 | | |

## Projects Supporting Universal Health Coverage

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 1. | Connect 59 level 4 health facilities to a safe and reliable Water supply | Countrywide | 359 | 168 | Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension | 16No. facilities connected |
| 2. | Connect 435 level 3 health facilities to a safe and reliable Water supply | Countrywide | 3,812 | 126 | Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension | 10 No. facilities connected |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 3. | Connect 2576 level 2 health facilities to a safe and reliable Water supply | Countrywide | 21,787 | 63 | Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension | 4No. facilities connected |
| | Total | | 25,958 | 357 | | |

## Key Projects Supporting the Big Four Agenda Projects

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 1. | Aberdare Bulk Water Project | Nyandarua and Naivasha | 25,000 | 50 | Proposed Multi-Purpose Dam and 20,000m3/ day Water Supply and pipelines to serve Naivasha Industrial Park, Ol Kalou in Nyandarua County, Naivasha and Gilgil Towns in Nakuru County. Project expected to serve a population of 200,000, adequate up to 2035 | Feasibility Study Done. Malewa Dam Project needs to be packaged to include Kinja and Pesi Dam |
| 2. | Thwake Multipurpose Water Development Programme Phase 1 | Makueni and Kitui | 42,364 | 7744 | Comprises of construction of Thwake dam with a storage capacity of 688 million cubic meters of water, development of 40,000 hectares of irrigation, development 20 megawatts of hydropower and development of water supply system to provide clean water to 1.3 million people | The Project implementation is ongoing at 72%. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 3. | Mwache Dam and Water Supply Project | Mombasa | 25,000 | 700 | Proposed Multi-Purpose Dam and Water Supply to produce 186,000 m3/ day and pipelines to serve Mombasa Industrial Park (Dongo Kundu), Mombasa, parts of Kilifi and Kwale counties. Project expected to serve a population of 1,500,000 up to 2030 people | Commencement of the Dam works was 4th March, 2022 |
| 4. | Mzima II Pipeline | Mombasa | 35,000 | 0 | Construction of 220km of 1.2m diameter pipeline from Mzima Springs to Mombasa to serve Mombasa Industrial Park (Dongo Kundu), Taita Taveta, Kwale, Kilifi and Mombasa Counties to serve a population of 1,050,000 people adequate up to 2030. | Loan application done to China Exim bank, Cabinet Memo prepared and submitted to NT & AG. |
| 5. | Northern Collector Tunnel | Nairobi | 15,000 | 1,300 | Construction of a 11.712 km long tunnel with 3.2m diameter from Maragua, Gikigie and Irati Rivers to Thika Dam Reservoir to and 40km bulk pipeline serve Nairobi City with 140,000m3/day. Project expected to serve a population of 1,200,000 people, adequate up to 2030 | Project implementation is ongoing at 90%. Excavation and lining of the tunnel has been completed. |
| 6. | Ruiru II dam | Nairobi | 25,000 | 2550 | Proposed Multi-Purpose Dam and Water Supply to produce an additional 50,000m3/day to serve Karuri, Kiambu and Githunguri. Project will serve a population of 300,000 people | Geotechnical investigations have done for Detailed Design. Contract Awarded. Resettlement of Project Affected Persons on Key Dam priority Areas ongoing. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 7. | Karimenu II dam | Nairobi | 27,150 | 5,400 | Proposed Multi-Purpose Dam and Water Supply to produce an additional 47,000m3/day to serve Ruiru, Juja and Thika. Project will serve a population of 300,000 people | Project is completed |
| 8. | Ndarugu I Dam and Water Supply | Machakos and Nairobi | 35,600 | 0 | The project entails construction of a 35m high concrete dam to impound 225 Million Cubic Metres of water with a treatment works with a capacity of 173,000m3/d and a transmission network of approximately 100km. The primary objective of the project is to meet the medium- and long-term water demand for Eastern parts of Nairobi, Juja, Ruiru, Ruai, Syokimau and Kitengela with a population of 1.5 million | Draft commercial contract has been prepared and submitted to the AG's office and the National Treasury; Cabinet Memo has been prepared to seek approval from the Cabinet. It was submitted for consideration under PPP framework. |
| 9. | Maragua IV Dam and Water Supply | Maragwa | 37,400 | 0 | The project entails construction of a 70m high Dam capable of storing 60 million cubic metres of water, Water treatment plant of capacity 140,000m3/d to supply Nairobi, Thika and Muranga. Construction of over 140km of transmission and distribution pipelines. Terminal storage tanks in Nairobi and Thika. The project will serve 1.2 million people in Nairobi, Muranga and Thika | EPCF&F advertised and is being evaluated by the implementation Agency. |

| S/No | Project Name | Service Area | Cost (Ksh. M) | Allocation FY 2020/21 (Ksh. M) | Description | Status |
|---|---|---|---|---|---|---|
| 10. | Kenya Towns Sustainable Water Supply and Sanitation Programme | In 28 Towns across the Country | 45,500 | 6,700 | Development of Water, Sewerage and Sanitation Projects for 28 Medium sized towns across the country. Details of this project are provided in Annex II. | Ongoing at 65% with major challenges being; wayleave encroachment, court cases on land intended for projects and delay in the counterpart funding from GoK |
| Total in Ksh. Millions | | | 301,324 | 21,263 | | |

## Annex VI: Proposed Large Scale and Strategic Irrigation Projects

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Lower Nzoia Phase II | • Location - Budalangi<br>• Siaya and Busia Counties<br>• Water source – Lower Nzoia<br>• Intake works and intake headrace construction ongoing under Lower Nzoia Phase I project<br>• A major irrigation scheme with a total area of 9,490 acres.<br>• Canal irrigation system with option for lining and closed conduits in some sections<br>Feasibility study and detailed designs completed. RAP carried out – land compensation not yet. | 9,490 | 1,992,900,000.00 | • Increase food production<br>o 118,625 bags of maize annually<br>o 11,388 MT of paddy rice<br>o Various horticulture and high value crops worth Kshs 2billion<br>• Create direct and indirect employment for 47450<br>• Add GDP value of Kshs 3.6 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction | • World Bank/ KfW had shown interest |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Lower Kuja Irrigation development Project, Lot 2 to 6 | Location - Nyatike District<br>Kisii, Migori Counties<br>Water source - Kuja River<br>Major irrigation scheme at a 19,290 acres net command area.<br>Intake weir and conveyance canals have been constructed.<br>Total length of Branch canal offtaking from the main canal is 26 km.<br><br>Feasibility study and detailed designs completed and land acquisition for primary infrastructure partially completed | 19,290 | 4,050,900,000.00 | Increase food production 241,100 bags of maize annually<br>23,151 MT of paddy rice<br>Various horticulture and high value crops worth Kshs 4billion<br>Create direct and indirect employment for 96,000<br>Add GDP value of Kshs 7.4 billion annually from value of produce.<br>Improve agricultural productivity through irrigation water management<br>Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | Construction works | Gok financed construction of the intake weir and conveyance canals under lot 1<br>JICA had shown interest and Rice Production intensification programme |
| Perkerra Irrigation scheme | Location - Marigat Baringo County<br>Water Source - Perkerra river<br>800ha of gazetted land as National Scheme<br>Scheme targeted for expansion to 5,050 acres<br>Components<br>Modernizing the irrigation system through lining of canals.<br>Improve water management modern irrigation system of drip or sprinkler combined with solar power.<br>10 No. night storage dams to supply the 15 No. units with water<br>Flood protection dykes and access roads<br><br>Feasibility study and detailed designs completed | 5,050 | 1,060,500,000.00 | Increase food production 126,250 bags of maize annually<br>Various horticulture and high value crops worth Kshs 1billion<br>Create direct and indirect employment for 25,000<br>Add GDP value of Kshs 2 billion annually from value of produce.<br>Improve agricultural productivity through irrigation water management<br>Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | Construction of modern irrigation infrastructure | Be financed through GoK expenditure<br>Project suitable for climate funding |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Lower Muranga irrigation development project | • Location - Murang'a County<br>• Water Source – R. Maragua, R. Thika, R.Sagana<br>• A major irrigation scheme at a 19890 acres by gravity flow net command area.<br>• Conveyance pipeline system, Sub-mains<br>• Distribution network (feeder lines), 89.0 Km<br>• Infield system for sprinkler and drip hectares communal land)<br><br>Feasibility study and detailed designs completed | 19,890 | 4,176,900,000.00 | • Increase food production<br>o 497,000 bags of maize annually<br>o Various horticulture and high value crops worth Kshs 4.2 billion<br>• Create direct and indirect employment for 99,000<br>• Add GDP value of Kshs 5.3 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure<br>• Value chain development and support | • The Spanish government had shown interest in financing the project |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Hola Irrigation Development Project | • Location - Hola<br>• Tana river County<br>• Water Source - Tana river<br>• 13,000 acres gazetted land however only 5000 acres has been developed.<br>• Objective is to provide a gravity water abstraction system and increase area under irrigation to 13,000 acres.<br>Components<br>• 1 Headworks at Aratolo Intake on Tana River;<br>• 3 No. Sedimentation Basins;<br>• 1 Main canal from the Aratolo headworks;<br>• 2 Branch canals from the Aratolo Main canal;<br>• 6 Sub-branch canals and 6 No.Sub-Main Pipelines<br>• Tertiary Pipelines/ Canals<br>• Access Roads<br>• Infield system including:- commercial farmers through center pivot and furrow system for local farmers<br><br>Feasibility study and detailed designs completed and land is government land thus minimal land acquisition requirements. | 13,000 | 2,730,000,000.00 | • Increase food production<br>o 325,000 bags of maize annually<br>o 13,000MT of cotton<br>• Create direct and indirect employment for 65,000<br>• Add GDP value of Kshs 5.4billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure | • BADEA had shown interest in funding the project |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Usueni – Wikithuki irrigation development project | • Location - Tana river<br>• Kitui County<br>• A major irrigation scheme at a 14280 acres by gravity flow net command area.<br>• Head works (at Makwenje across Tana river)<br>• Conveyance system (18.87km both twin 1 and 2);<br>• Mainline (22.53 km twin 1 and 18.95km twin 2);<br>• Sub-mains(23 lines ;40.52 km network)<br>• Distribution network (feeder lines)<br>• Infield system (2000 hectares; 2507 individual connections and 795 hectares communal land)<br><br>Feasibility study and detailed designs completed | 14,280 | 2,998,800,000.00 | • Increase food production<br>o 357,000 bags of maize annually<br>o 7100 MT of cotton<br>o Various horticulture and high value crops worth Kshs 1.5 billion<br>• Create direct and indirect employment for 71,000<br>• Add GDP value of Kshs 5.9 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure | • The Indian Exim bank had shown interest to finance the project |
| Ahero West Kano Irrigation Project | • Location - Nyando River and L. Victoria<br>• Kisumu County<br>• Objective is to provide a gravity water abstraction system and increase area under irrigation to 5,130ha.<br>• Components include Intake structure (side weir) for gravity system<br>• Conveyance and distribution network<br><br>Feasibility study and detailed designs completed | 12,825 | 2,693,250,000.00 | • Increase food production<br>o 30,780 MT of paddy rice<br>o Various horticulture and high value crops worth Kshs 2.7 billion<br>• Create direct and indirect employment for 64,000<br>• Add GDP value of Kshs 7.12 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction works for irrigation infrastructure | • JICA had shown interest and Rice Production intensification programme |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Nyabomite irrigation development project | • Location - Charachani<br>• Nyamira County<br>• Water Source – R. Charachani, R. Eaka<br>• A major irrigation scheme at a 2000ha by gravity flow net command area.<br>• Head works: - 2 No. Chacharani and 1 no. bombo- Bokimori<br>• Conveyance pipeline system 23.05Km<br>• Sub-mains 22.1 Km<br>• Distribution network (feeder lines), 89.0 Km<br>• Infield system for sprinkler and drip hectares communal land)<br><br>Feasibility study and detailed designs completed. | 5,000 | 1,050,000,000.00 | • Increase food production<br>o 192,750 bags of maize annually<br>o Various horticulture and high value crops worth Kshs 1.6 billion<br>• Create direct and indirect employment for 38,000<br>• Add GDP value of Kshs 4.28 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure<br>• Value chain development and support | • The Spanish government had shown interest in financing the project |
| Lumi Irrigation development project | • Location - Lumi River<br>• Taveta County<br>• A major irrigation scheme at a 14,100 acres by gravity flow net command area.<br>• Head works (weir, retaining walls, intake, protection works);<br>• Canals (main, branch, sub-branch and tertiary);<br>• Drains (mains and tertiary);<br>• Canal and drain structures (drops, culverts, turnouts, division boxes, cross drainage structures, flumes, etc);<br>• Access and farm roads;<br><br>Feasibility study and detailed designs completed | 14,100 | 2,961,000,000.00 | • Increase food production<br>o 173,300 bags of maize annually<br>o 16,929 MT of paddy rice annually<br>o Various horticulture and high value crops worth Kshs 3billion<br>• Create direct and indirect employment for 70500<br>• Add GDP value of Kshs 5.4 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure<br>• Value chain development and support | • GoK funding<br>• Suitable for funding under climate resilience |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Soy Irrigation Development Project | • Location - Soy<br>• Water Source - Little Nzoia River on Ziwa dam 2<br>• Kakamega and Uasin gishu Counties<br>• A major irrigation scheme at a 3750 acres by gravity flow net command area.<br>• Head works (Intake chamber)<br>• Conveyance pipeline using Upv and GI<br>• 2 No storage dams with capacity of 2,432M m3<br>• Infield system for sprinkler system<br><br>Feasibility study and detailed designs completed | 3,750 | 787,500,000.00 | • Increase food production<br>o 93,750 bags of maize annually<br>o Various horticulture and high value crops worth Kshs 787 million<br>• Create direct and indirect employment for 18,750<br>• Add GDP value of Kshs 1 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Construction of Irrigation infrastructure<br>• Value chain development and support | • The Spanish government had shown interest in financing the project |
| Upper Nzoia Irrigation Development Project | • Location - Kuywa, Lunyu, Tongaren and Webuye<br>• Bungoma County<br>• Water source – R. Nzoia, R. Kuywa, R. Kibisi<br>• A major irrigation scheme at 21250 acres by gravity flow net command area.<br>• 4 Head works (Intake chamber)<br>• Conveyance pipeline using Upv and GI<br>• Infield system for sprinkler system<br><br>Feasibility study and detailed designs completed; land acquisition not done | 21,250 | 4,462,500,000.00 | • Increase food production<br>o 531,250 bags of maize annually<br>o Various horticulture and high value crops worth Kshs 4.46 billion annually<br>• Create direct and indirect employment for 106250<br>• Add GDP value of Kshs 5.7 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding proposal from Turkish exim bank presented to National Treasury |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Thwake irrigation Area I and II | • Makueni and Kitui Counties<br>• Water Source – Thwake dam-Athi river<br>• Total area 40075 ha (Area 1 – 3172ha and Area II 36,900ha)<br>• Draw down tower – in the dam and conveyance system for area 1, intake on R. Athi and conveyance canals for area II.<br>• Infield sprinkler irrigation system<br><br>Feasibility study as part of Thwake dam carried out. Detailed design not carried out. Thwake dam is under construction. | 100,187.5 | 21,039,375,000.00 | • Increase food production<br>o 3,100,000 bags of maize annually<br>o 32,000MT of cotton – targeting 20,000 acres<br>o Various horticulture and high value crops worth Kshs 25 billion annually.<br>• Create direct and indirect employment for 300,000<br>• Add GDP value of Kshs 32.13 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Increase food production<br>o 3,100,000 bags of maize annually<br>o 32,000MT of cotton – targeting 20,000 acres<br>o Various horticulture and high value crops worth Kshs 25 billion annually.<br>• Create direct and indirect employment for 300,000<br>• Add GDP value of Kshs 32.13 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being | • AfDB has show interest in funding irrigation as a fit for purpose use for Thwake dam. |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Kavunyalal | • Malindi Sub-county, Kilifi County<br>• Water source, Sabaki river<br>• 2,170 ha<br>• Intake weir, canals and distribution system<br><br>Feasibility study and detailed design carried out. | 5,425 | 1,139,250,000.00 | • Increase food production<br>o 162,750 bags of maize annually<br>o Various horticulture and high value crops worth Kshs 1.36 billion<br>• Create direct and indirect employment for 27,000<br>• Add GDP value of Kshs 1.74 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |
| Greater Bura | • Location - Tana River Basin<br>• Kitui, Garissa and Tana River Counties<br>• Water source – Tana River<br>• Construction of HGF Dam<br>• Saka-Garissa Conveyor<br>• Nanigi Barrage<br>• Masalani Conveyor<br><br>Feasibility study and detailed designs completed. RAP and Compensation not yet done | 50,000 acres | 10,500,000,000.00 | • Increase food production<br>• Pasture for livestock<br>• Create direct and indirect employment<br>• The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output;<br>• Improve agricultural productivity through irrigation water management<br>• The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural electrification and economic development;<br>• Enhanced cross-cultural relations by attracting people from other cultures. | • Construction of HGF Dam<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Turkwel and Kerio | • Location - Turkana<br>• Turkana County<br>• Water source – Turkwel and Kerio Rivers<br>• Pre-feasibility study for the middle and lower Turkwell and Kerio River Basins<br>• Detailed Feasibility indicating feasibility Study option or options with a net irrigable area of up to 30,000ha preferably in one location/basin<br>• Detailed design of Intake, supply, Distribution and on-firm infrastructure<br>Feasibility study and detailed designs completed. Lowaat Dam designs completed | 60,000 acres | 12,600,000,000.00 | • The project will improve yields through reduced crop loss due to erratic, unreliable or insufficient rainwater supply;<br>• 1.2 Million Bags of Maize<br>• The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output;<br>• It will allow a greater area of land to be used for crops in areas where rain fed production is impossible and is therefore likely to boost output and income levels;<br>• The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural electrification and economic development; | • Construction of Lowaat Dam to regulate flow on Kerio River<br>• Construction of Irrigation infrastructure | • Funding required for implementation. |
| Rahole | • Location - Mbalambala<br>• Garissa County<br>• Water source – R. Tana<br>• Construction of 2km farm access roads within farm<br>• Construction of 4.5 km secondary canal network within the farm<br>• Construction of farm infield structures i.e division structures (6 major and 25 small)<br>• Completion of 4.5 km drains and 2km dyke<br>• Completion of solar fence | 7500 acres | 235,537,830.00 | • Increase food production<br>• Pasture for livestock<br>• Create direct and indirect employment<br>• The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output;<br>• Improve agricultural productivity through irrigation water management<br>• The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural electrification and economic development;<br>• Enhanced cross-cultural relations by attracting people from other cultures. | Completion of water conveyance and distribution works | • Funding required for implementation. |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Kayatta | • Location: Matungulu and Mwala<br>• Machakos County<br>• Benefit over 12,500 farmers each irrigating a proposed area of 0.4 Ha<br>• Munyu Dam – Embankment Dam 35m High and 700m long Dam Crest<br>• Head Works<br>• Sedimentation Basin<br>• Break Pressure Tank<br>• Conveyance Pipeline<br>• Main Pipeline<br>• Distribution Pipeline<br>• Infield system<br>Feasibility study and detailed designs completed. RAP and Compensation not yet done | 10,000 acres | 2,100,000,000.00 | • It is estimated that net production will increase from 55 million to 1.7 Billion without and with project respectively<br>• Sustainably supply water for irrigation thorough development of irrigation infrastructure for 5,000 ha.<br>• Improve food self-sufficiency and security in the project area through promotion of irrigated agriculture.<br>• Create gainful employment opportunities<br>• Improve income per capita hence wealth creation. | • Design Dam<br>• Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |
| Suba | • Homabay County<br>• Water Sources: Lake Victoria<br>• Project comprises of five projects/clusters namely:-<br>1. Rang'wena;<br>2. Nyagidha;<br>3. Olambwe;<br>4. Sindo and<br>5. Konyango<br>• Head Works<br>• Sedimentation Basin<br>• Break Pressure Tank<br>• Conveyance Pipeline<br>• Main Pipeline<br>• Distribution Pipeline<br>• Infield system<br>• Drainage works<br>Feasibility study and detailed designs completed. RAP and Compensation not yet done | 5,250 acres | 1,102,500,000.00 | • 315,000 Bags of Rice annually<br>• Create direct and indirect employment for 200,000<br>• Add GDP value of Kshs 1.8 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 45% thereby improving their socio- economic well being | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Kisumu | • Kisumu County<br>• Seme<br>• Chiga<br>• Awach Kano<br>• Ombeyi<br>• Construction of intakes<br>• Canals<br>• Drainage works<br>Feasibility study and detailed designs completed. RAP and Compensation not yet done | 9,375 acres | 1,968,750,000.00 | • 221,250 Bags of Rice<br>• Create direct and indirect employment for 106250<br>• Add GDP value of Kshs 2.7 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |
| Bondo | • Bondo<br>• Siaya County<br>• Water source: River Yala and Lake Victoria<br>• Head works (weir and intake)<br>• Sedimentation basin;<br>• Pump intake;<br>• Delivery pools;<br>• Irrigation Canals (Main, branch, sub-branch, tertiary and field);<br>• Pipeline;<br>• Drainage Canals (mains, collector and field));<br>• Related canal and drain structures;<br>• Roads (inspection and farm roads);<br>• Flood protection dyke;<br><br>Feasibility study and detailed designs completed. RAP and Compensation not yet done | 8,000 acres | 1,680,000,000.00 | • 480,000 Bags of Rice annually<br>• Create direct and indirect employment for 200,000<br>• Add GDP value of Kshs 1.8 billion annually from value of produce.<br>• Improve agricultural productivity through irrigation water management<br>• Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.<br>• Improved the income levels of the local population by at least 45% thereby improving their socio- economic well being | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |

| Project Name | Project Features | Irrigation Area acres | Project cost kshs | Contribution to Big four (Results/Project Benefits) | Action Required | Financing options |
|---|---|---|---|---|---|---|
| Burangi | • Magarini sub-county, Magarini location, Marikebuni and Pokea Mwana Sub-locations<br>• Kilifi County<br>• Water source - Sabaki River]<br>• Sedimentation Basin<br>• Break Pressure Tank<br>• Conveyance Pipeline<br>• Main Pipeline<br>• Distribution Pipeline<br>• Infield system | 1,169 acres | 245,490,000.00 | • Ensure food security at the local and national level with approx. 46,760 bags of Maize<br>• Creation of employment and income generation of the locals approx. 3,000 people<br>• Sustainable supply of raw materials for agro-based industries<br>• Foreign exchange generation through export of surplus food and cash crops. | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |
| Mwangea | • Ganze Subcounty<br>• Kilifi County | 3,900 acres | 819,000,000.00 | • Project will go a long way in improving the social, economic and cultural lives of the people in the project area in many ways including:<br>• Increased farm output approximately 156,000 bags of maize<br>• Increased family income<br>• Improved access to social amenities e.g. hospitals and schools<br>• Improved infrastructure | • Review of design<br>• Construction of Irrigation infrastructure<br>• Value chain development and support | • Funding required for implementation. |
| **Total** | | **398,731** | **83,733,615,000.00** | Summary of contribution to Big 4 annually | | |
| | | | | Rice paddy in MT | | 368,748 MT |
| | | | | Maize 90kg Bags | | 8,502,760 |
| | | | | Rice 75Kg Bags | | 1,068,350 |
| | | | | Value of horticultural crops | | Kshs 75 B |
| | | | | Jobs created | | 1,993,655 |
| | | | | Contribution to GDP | | Kshs 114 B |

## Annex VII: List of Weather Stations configured to transmit data to WRA server

| Name | latitude | longitude | County |
|---|---|---|---|
| Sigor Deputy County Commissioner office | -0.9175 | 35.3 | Bomet |
| Huduma Centre | -0.78556 | 35.33667 | Bomet |
| Sotikvetinery office | -0.68861 | 35.11389 | Bomet |
| Kangeta Primary School | -0.69328 | 37.51638 | Embu |
| Thiba WRA SRO | -0.49572 | 37.27314 | Kirinyaga |
| County Commissioner Isiolo (NEMA office) | 0.354712 | 37.58329 | Isiolo |
| Lenkisim Mixed Secondary School | -2.40118 | 37.21966 | Kajiado |
| Tebesonik Secondary School | -0.56311 | 35.09352 | Kericho |
| Soin Agriculture Training Center | -0.19263 | 35.16022 | Kericho |
| Kaptele Primary School | -0.5991 | 35.07727 | Kericho |
| Ruiru G. K. Prison | -1.13792 | 36.93231 | Kiambu |
| Gatatha Farmers Company | -1.13146 | 36.76158 | Kiambu |
| Limuru Sub County HQS | -1.1093 | 36.6398 | Kiambu |
| St. Monica Marani Girls High school | -0.57984 | 34.79734 | Kisii |
| St AnjelaSengera Girls High school | -0.85878 | 34.7243 | Kisii |
| St. Peters Suneka Secondary School | -0.67555 | 34.70008 | Kisii |
| Gianchere Friends School | -0.74594 | 34.86553 | Kisii |
| St. LukesKavia Secondary School | -1.43048 | 38.08253 | Kitui |
| St Paul Ikanga Boys High School | -1.70116 | 38.06836 | Kitui |
| Kanyangi Girls Secondary School | -1.7556 | 37.9101 | Kitui |
| Kyome Boys Secondary School | -1.06561 | 38.04456 | Kitui |
| Mua Hills Girls High School | -1.43502 | 37.21801 | Machakos |
| Deputy County Commissioner Office Matungulu | -1.22446 | 37.27006 | Machakos |
| Kathiani Girls High School | -1.41758 | 37.32388 | Machakos |
| Mukaa Sub County HQS | -1.79062 | 37.21536 | Makueni |
| Mukaa Boys Secondary School | -1.83538 | 37.32767 | Makueni |
| Kitoto Secondary School | -1.73774 | 37.79026 | Makueni |
| Christ the King Igembe School | 0.18864 | 37.96412 | Meru |
| Kimakia Forest Station | -0.81412 | 36.78279 | Muranga |
| FTC Kenyatta Farm | -0.80532 | 36.93667 | Muranga |
| Wanjerere Meteorological Site | -0.66809 | 36.88035 | Muranga |
| Kongoi Weather Station | -0.31912 | 35.54064 | Nakuru |
| Elburgon Forest Station | -0.27071 | 36.08516 | Nakuru |
| Lake Nakuru National Park | -0.35477 | 36.10006 | Nakuru |
| MoALFOlolulunga | -1.00239 | 35.66908 | Narok |
| MoALFKilgoris | -0.99861 | 34.88044 | Narok |

| Name | latitude | longitude | County |
|---|---|---|---|
| Suswa Ramat Holding Ground | -1.06329 | 36.33507 | Narok |
| Heni Secondary School | -0.54811 | 36.34606 | Nyandarua |
| Ndaragwa Forest Station | -0.06316 | 36.5407 | Nyandarua |
| Kambaa Technical Secondary School | -0.13647 | 36.52516 | Nyandarua |
| Kiandongoro Forest Station | -0.2876 | 36.7659 | Nyeri |
| Gathaithi Primary School | -0.43774 | 37.17959 | Nyeri |
| Sagana State Lodge | -0.367 | 37.067 | Nyeri |
| Caritas Kanjoro | 0.005355 | 38.09257 | Tharaka Nithi |
| Caritas Kamaindi | -0.38999 | 37.82562 | Tharaka Nithi |




REPUBLIC OF KENYA

PREPARED AND COORDINATED
BY
MINISTRY OF WATER, SANITATION AND IRRIGATION
Maji House, Upper hill,
Off Ngong road, Nairobi
P.O BOX 49720 – 00100, Nairobi
Telephone: +254 020 2716103, 4900000
Fax: +254 020 2727622
Email: ps@water.go.ke
Website: http://www.water.go.ke